AMERICAN AGRICULTURIST

FOR THE

FARM · GARDEN · & · HOUSEHOLD

"AGRICULTURE IS THE MOST HEALTHFUL, MOST USEFUL, AND MOST NOBLE EMPLOYMENT OF MAN."—WASHINGTON.

VOLUME L.—No. 5. NEW YORK, MAY, 1891. NEW SERIES—No. 532.

TOWN AND COUNTRY SCENES OF MODERN GREECE.

COPYRIGHT, 1891, BY THE ORANGE JUDD CO.

ENTERED AT THE NEW YORK POST-OFFICE AS MAIL MATTER OF THE SECOND CLASS.

THE AGRICULTURE OF MODERN GREECE.

FRANK G. CARPENTER.

FARMING in Greece has steadily improved since the country was freed from the tyranny of the Turks. Under the rule of the Sultan it became a wilderness. Brigandage flourished everywhere, the irrigating works of the past were destroyed, and the Turkish soldiers laid waste the vineyards, cut down the olive groves and burned up the forests. Now, the marshes are being drained, the mountains are being terraced, new trees and vines are seen on every hillside, new lands are being broken up and the people are going straight ahead. One can travel as safely in Greece to-day as in America, and will find everywhere a frugal, temperate, and thrifty people. The country is as yet in its infancy as to modern agricultural development, but the Greeks are as anxious for new things as they were when Paul preached to the people of Athens on Mars Hill. They are the most independent people to be found outside of America, and they may be called the Yankees of the Mediterranean. The poorest farmer will discuss politics, and the working man feels that he has as much right to make a stump speech, or to vote on the delegates to the Greek Parliament, as any man in the United States. The Greeks are very proud of their country, and they believe it has to-day a great influence on the politics of Europe. They think it will in the future regain the prominence that it had in the past, and the proudest thing they can say of themselves is that they are Greeks.

Nevertheless Greece is but a small country. If it were offered for sale in the real estate markets of the world it would not bring a high price. The whole of it could be lost inside of Ohio, and a fast railroad train could go from one end of it to the other in four hours. It is only two hundred miles long from north to south and only one hundred and eighty miles broad from east to west at its widest point. The sea wraps it round so that no part of it is forty miles distant from it, and fully the half of it is not capable of cultivation. All told, the country has not as much good farming land as the State of Massachusetts, and a great part of this is yet to be reclaimed.

The farming methods which prevail in Greece to-day are the same as those of the days of Homer. The same plows are used as those one sees on the inscriptions of the temples, and the wheat is still cut by the sickle, and bound with the hands. A great deal of the harvesting is done by women, and the Greek maidens of to-day, in their picturesque costumes as they labor in the field, are quite as handsome as they were when Socrates talked philosophy, and Demosthenes practiced speaking with pebbles in his mouth. The plowing is chiefly done by oxen, and the farmers have little idea of the modern methods of fertilization. They know nothing of the rotation of crops, and they plant the same crop year after year until the fields are worn out, and then let them lie fallow for a couple of years to recuperate. I saw no fences anywhere about the fields, and there seemed to be no systematic farming. One of the great troubles was the lack of rain and running water, but this is being remedied somewhat by irrigation. The soil is generally thin and light, but it will, I am told, produce bountifully if it can be well watered, and with proper fertilization it would bring fair crops.

The farmers live in villages and go out into the fields to work. They live almost altogether in the open air, and during the summer the majority of them sleep out of doors. The houses are, as a rule, small and rather mean in comparison with the homes of the peasantry of other European countries. They have stone floors, and the poorer ones have neither windows nor chimneys. Such as are of two stories have a stable on the ground floor, and the people live above this, and go up by a stairway from the outside. There is almost no furniture to speak of, and a little stone stove or an open fire constitutes the cooking arrangements. There are no modern conveniences connected with the houses of the poor, and one may travel for a day in the country without finding a washbasin.

The diet of the people is of the simplest possible nature. I did not see a drunken man while I was in Greece, and there is but little gluttony in a country where bread and wine and onions make up the average dinner. Very little meat is eaten, and goats' cheese and dried olives largely take the place of meat. The Greeks seem to be very fond of salads, and they make salads of all kinds of greens. Olive oil takes the place of butter, and is eaten upon everything. Farm hands are usually fed upon bread and olives, and on feast days a little mutton or goats' flesh is added. Beef is practically unknown to the farmer, and such good beef as there is in Greece is imported. Easter is the great Thanksgiving day all over the country, and a roast lamb at that time in Greece takes the place of our Thanksgiving turkey. One of the delicious dishes made by the Greeks is known as pilaff. It is a stew of rice and chicken, and is common in Turkey as well. Some honey is produced, but I saw no practical bee-keeping, and I did not think the famed honey of Hymmettus was as sweet nor as well-flavored as that of Jerusalem, or of Switzerland.

The olives of Greece are very fine, and their silvery green leaves are seen in every landscape. They are one of the great crops of the country, and there are three hundred and twenty-five thousand acres of trees. The trees are planted about twenty feet apart and they are plowed twice every year. They come into full bearing when twenty years old, and bear for centuries. An acre ought to produce thirty-three gallons of oil every year. The wines are not so good as the olives, though a great many grapes are raised, and the people everywhere drink wine. The farmers put resin in the wines to preserve them, and this gives the liquors a very disagreeable taste. The best grape crop of the country is that of the currant grape. The word currant comes from the name of the city of Corinth in Greece, and it is along the gulf of Corinth that the currants are raised which we use in our plum-puddings. They are a little seedless grape, which it is said can be raised nowhere else than here, and which is shipped all over the world. These grapes are raised in immense vineyards, and in sailing from Patras along the gulf of Corinth one passes miles upon miles of them. The hills are terraced, and upon some of these terraces there are no vines, and here the grapes are dried before being shipped. Along the gulf there are fields of white sand which are also used for the drying of the currants, and the currant crop is so important to the country that an ambassador was sent from Greece to the United States not long ago to ask Congress to reduce the tariff on currants. Great Britain takes about $7,000,000 worth of these currants every year, and we are, I think, the next best customer for them. We take about thirteen thousand tons every year, and this is about one-twelfth of the whole crop. It is a question in the minds of some agriculturists as to whether these currants could not be produced in America. We have all sorts of climates, and some parts of California must correspond very closely to the climate of Corinth. A good currant vineyard would be very profitable. Even in Greece the vines produce a net profit of $40 per acre, and a currant vineyard is there worth $450 per acre. The Greek vines begin to bear in their sixth year, and are in their full perfection when they are twelve years old. They continue to bear well for fifty years and vines are known which have borne for one hundred years. It will be thus seen that a currant vineyard is a fortune. They are cared for like those of the ordinary vineyard, save that they are not allowed to grow more than four feet high. The grapes are ready for gathering in August, and are easily dried and packed for shipment. California has proven that she can raise very good olives, and there is no reason why she should not attempt the currant grape. The demand for currants steadily increases, and Marseilles has of late years been buying a great many for use in the making of French wines. The currants are, I am told, mixed with the grapes, and are taken in their dried state for this purpose to France.

A very fair quality of wheat is raised in Greece, and barley, tobacco, cotton, and Indian corn are among the products of the country. The cotton was first planted at the time of our late Civil War, when the price went up to such an extent that it was introduced into Egypt and India. It is now grown on the plains of Thessaly and near Thebes. It produces well but there are factories in Greece which take nearly the whole of the product. The tobacco raised is by no means as good as that of the Turks. The people are a nation of smokers, and the cigarette is in every man's mouth.

What the farmers of Greece need more than anything else is capital and, as the country grows wealthier, its agricultural condition will steadily improve. There are now no roads to speak of throughout the country, and ten years ago there were only about five miles of railroad in the whole of Greece. Now there are three hundred and eighty-nine miles of railroad, and one can go from Athens to Corinth by rail. A line has just been projected which

will run from Athens north and will make the port of the Piræus one of the great shipping ports of the Mediterranean. Athens will then become a great city, and, it may be, larger than it was in ancient times. The steamboats coming from India and China will land their passengers here instead of in Italy, and Athens will take the place of Brindizi and Naples. A canal is being cut across the Isthmus of Corinth, and this will save two days for all ships going from Italy to Constantinople, and an immense amount of shipping, which now sails around Greece, will be brought to it.

As it is, the government does everything it can to encourage farming, and the Greek statesmen were not long ago discussing the foundation of an agricultural bank, which should lend money to farmers, and the basis of whose loans should be land security. The capital of this bank was to have been raised by confiscating the lands belonging to the convents, giving the half of the amount realized from them, in the way of pensions, to the monks, and using the other half for the bank. Inasmuch as these lands are worth about $17,000,000, it will be seen that a very fair banking institution could have been established from them.

During the occupancy of the Turks, two-thirds of the land belonged to the Sultan, and these all came into the hands of the government at the time of the revolution. Since then the peasants, or rather the people, for there are no orders of nobility in Greece, have been rapidly acquiring lands, and within late years the lands have largely gone into the hands of small farmers. The government does everything it can to promote agriculture, and such of its lands as are rented bring in only fifteen per cent of their crops to the government. Other private lands when rented out pay the owner one-third of the net crops, and there are some large tracts given over to tenant farmers.

One of the great drawbacks to farming during the past years, which is now happily done away with, was the tithing system, which came down from Turkish times. By this the farmer had to give one-tenth of all he raised to the government. He had to carry his crops to the public thrashing floor, and the tax collector decided how much was the government's share. The collection of these tithes was farmed out, and the heart of the profits went to the tax gatherers. Now, the taxes though high, are, I am told, fairly collected, and the farmers in many cases save money.

A Greek farmer would be a curiosity if he could be transplanted in his native dress from the Plains of Marathon or Troy to an American village. One would be in doubt whether to take him for a man or a woman until looking at the hair on his face, and many of the Greek farmers look as though they were dressed for the ballet rather than for the field. They wear knee-breeches and leggins, and above these show out about a dozen short white skirts which are stiffly starched, and which stand out from the waist like those of the girl in tights who rides the bare-backed horse at the circus. Above these skirts there is a vest covered with embroidery, and a Fez cap completes the outfit with the exception of the shoes. These are usually of red leather. They are turned up at the toes like the old-fashioned skates, and there is a red woolen tassel on each toe. In their Sunday clothes the Greeks are as gorgeous as was old Solomon, and they strut about as though they owned the earth.

The women have also curious costumes and there are different dresses for nearly every locality. The dresses as a rule are long and flowing, and they well become the tall, well-formed, long-limbed Grecian maidens. In the fields the girls wear a single gown of linen, which falls from their necks to their feet; without, however, the fullness or the disgusting train of the American "Mother Hubbard." Over this gown they wear a sleeveless sack of white wool, bordered with stripes of black. Upon their heads they wear large knit or felt red caps, or bright-colored handkerchiefs, and their feet are often bare. They carry heavy burdens on their backs, and they are industrious, thrifty and intelligent. Every girl, as soon as she is old enough to sew, begins to embroider a fine skirt or gown with silk to be used upon her wedding-day, and I bought a gown of this kind in Athens, which had a band of silk embroidery a foot deep along the edge of the skirt, and the silk in which weighed several pounds.

The country people of Greece are very fond of holidays. About one-third of the whole year is taken up in fast and feast days, and these prevail to such an extent that the Albanians come down in companies, at the time of harvest, and work under captains in order to help with the crops. They are better workmen than the Greeks, in that as they are Mohammedans they do not lay off for feasting or fasting. I visited, on the old historic grounds of Eleusis, where Cicero was initiated in the mysteries when he visited Greece, and where all of the great Greek poets were wont to go, a farm village and witnessed a country dance. A score of Greek maidens clasped hands and moved to and fro in slippered feet to music. The girls had the Greek features of ancient times and their faces shone out like rare pieces of sculpture in flesh and blood. Their long, loose gowns, seemed a part of their tall beautiful forms as they gracefully glided over the grass, making their way to and fro upon beds of the reddest and biggest poppies ever to be seen. Their shoulders were dressed in gorgeous vests, and many of them had breastplates of gold coins hanging from their necks. Their heads were draped with long veils of white silk, the ends of which hung down their backs, and flowed in the air as they danced. Their vests and jackets were of purple and gold, and under these vests hung down sleeveless coats of the finest white wool. Every maiden had a bright silk apron of a gay color, and the gold and silver buckles which clasped the belts at their waists were made of discs of precious metals, as big around as the bottom of a tin cup. The amount of jewelry on each maiden represented, I was told, the sum total of her possessions, and gave to the beaux present an idea of the dowry which their sweethearts might bring them in marriage.

I chatted with both men and women, and I found them intelligent and kind. Greece has now a system of compulsory education, and even among these people I found some who could quote Homer, and who could have discussed the orations of Demosthenes with any college professor. There is no brighter people on the face of the earth than this Greek nation. They are in business the equals of any people in the world, and there is a saying in the East that one Jew is equal to two Turks, but that one Greek is equal to two Jews; and the Turks have also a saying which reads something like this: "From the Jews, the Armenians, and the Greeks, good Lord deliver us." They already do a large part of the business of the East. The best houses in Alexandria are owned by Greeks, and the city of Athens has as fine public buildings as are found anywhere. It has a university which will rank up with our American colleges, which has two thousand students and nearly one hundred professors. It has a girls' college which contains eight hundred students, and good schools are being established all over the country. Athens has a fine theater, a big National Museum, a street car line, and there is a steam tramway which runs from the town to the seashore. It has a stock exchange, and there are half a dozen newspapers, several of which are dailies. The people of Greece have the same complexion and to a great extent the same features that we have, and if it were not for the language, and the Greek letters of the signboards over the business houses, one might suppose himself to be in an American city instead of in the Capital of Greece. It is only out in the country that the queer costumes which I have described prevail, and Athens is the New York and Washington of the Greek kingdom. In it are seen the best types of modern Greek enterprise, and from it are going out the influences and movements which will turn the old Greece of the Middle Ages and of Turkish times into the new Greece of the twentieth century, when it will again blossom like the rose, and will again be as it was in the days of Solon and Lycurgus, one of the great countries on the globe.

CULTIVATION OF BARLEY—IV.

JOSEPH HARRIS.

There has been very little attention paid in this country to the introduction of new varieties of barley, and the few that have been tried are not popular with the maltsters, and if they buy them at all they want them at lower rates. The process of malting consists in soaking the barley in water and then spreading it out about a foot deep in a warm room until it sprouts. The process of germination converts the starch of the grain into sugar. The same thing takes place in the soil. When all the starch is converted into sugar, and the seed is allowed to keep on growing, the new growth lives on the sugar. But the maltster does not wish this. It is sugar that he wants, and he aims to allow the barley to grow until all the starch is converted into sugar, but to stop the growth before any of the sugar is converted into carbonic acid. It is here where the skill of the maltster comes into play. He must hit the exact time when the process of germination has converted the starch into sugar, and must not allow it to proceed an hour longer. When this time arrives, further growth is arrested by throwing the sprouted barley on a heated surface. As every one who has been in the habit of testing seeds knows, there is quite a difference in the period of

germination between different varieties. And it is so with different varieties of barley. It will not do, therefore, for the maltster to mix different varieties. If a new variety is to be introduced, it must be grown extensively enough to furnish a sufficient quantity to induce the maltsters to use it. Then, if it proved to be an improvement, they would pay a higher price for it. But at first there would be no chance for the introducer to sell a small quantity.

At the present time we have practically but two varieties of barley, the two-rowed and the six-rowed. Or, to state it still more accurately, one variety is the two-rowed, and the other is not two-rowed. The two-rowed barley is the kind exclusively used in England. It is a later and more vigorous growing kind than the six-rowed, and the grain is decidedly heavier. It would not be accurate to say that the two-rowed commanded a higher price in England than the six-rowed, for as a matter of fact the maltsters would not look at the six-rowed. In this country, on the other hand, six-rowed barley commands a higher price than two-rowed. And on this account, and on this only, it is more profitable to grow. If both brought the same price the two-rowed would, on good land, be more profitable to grow than the six-rowed. This is not only because it will produce more grain per acre, but because it stands up better and has longer straw and can be cut and bound with the machine, and last, but not least, we can frequently get through with wheat cutting before the two-rowed barley is ready.

The following paragraph from a recent English paper is of interest: "Fifty quarters (400 bushels) of Canadian-grown barley, of the two-rowed variety called "Prize Prolific," have been sent to England, by order of the Minister of Agriculture, to be malted and brewed in one of the best breweries in England. It is then proposed to ask a committee of British experts to fix its value. By this practical test the government is anxious to demonstrate to English brewers that Canada can produce the class of barley they require." Now that the United States market is practically closed to the Canadian barley growers, they are looking to England. And England wants two-rowed barley. Our Canadian readers doubtless understand this matter. For their own sake, as for ours, we hope they will not grow six-rowed barley. If they do they will have to send it here subject to a duty of thirty cents per bushel. They can just as easily grow two-rowed and supply the English market.

It may be asked why it is that if two-rowed barley is better than six-rowed our maltsters pay more for six-rowed than for two-rowed? We have never been able to get a satisfactory answer to this question. One reason is that the six-rowed germinates quicker than two-rowed, and less time is required in the malting process. There are a few localities where two-rowed barley is preferred to six-rowed, and if the maltsters could not get it for less they would pay even more than for six-rowed. But in the general market six-rowed brings the highest price, and is consequently the more profitable kind to grow.

At the present price of oats and barley, oats are a more profitable crop than barley, and far easier to grow and harvest. Like hops, barley is more or less of a speculative crop. Occasionally the crop proves highly profitable, but it is often grown at a loss. One of my neighbors, a very successful farmer and barley grower, became convinced that he ought not to grow barley for the maltsters, and for the last twenty years of his life substituted oats for barley. I do not think he lost a cent by the change.

SUGAR BEET CULTURE IN AMERICA.

PROF. WILLET M. HAYS, MINNESOTA AGRICULTURAL EXPERIMENT STATION.

Though a number of factories, large and small, have failed in the economical production of sugar from beets in the United States, no one has given a satisfactory reason for it except the bad management of the factories. The high price of labor has been held up as the most serious obstacle, but on our very cheap and rich lands, where expensive fertilizers are as yet not needed, there seems to be no reason why, with the present improved cultivating machinery, beet sugar cannot be made at a profit. The great States of the Upper Mississippi Valley have a very large proportion of rich, mellow, loamy soil in which sugar beets grow and become rich in sugar, and remain pure or free from those compounds which can be removed only with difficulty in separating and refining the sugar. The abundance of clear weather and sunshine give the beets the greatest possible opportunity for transforming the bountiful plant food into sugar. Analyses made during the last few years at the various experiment stations, at the Department of Agriculture, and by parties interested in manufacturing sugar show that beets of higher quality can be raised here than are the beets grown for the European factories. This is true, notwithstanding the fact that the persons who grew them did not, as a rule, know and practice the best methods of raising beets of high quality.

Most of the analyses we have now at hand for these northerly States are of beets grown in 1890, which was not very favorable for rich beets, as the spring was wet, cold and late. The fall also was moister and cooler than usual, thus tending to make large, coarse roots. The fact that many of these beets were grown on excessively rich soils and far apart also in many cases had the same effect, making the per cent of sugar lower than would have been the case under proper cultivation. The fact that many of them grew on rather hard soil, not made mellow by deep stirring, causing them to grow mainly above ground, was also very seriously against their showing a high percentage of sugar in their juice. Some beets showed as high as twenty per cent of sugar, while the average of all the analyses I have seen is above the ordinary standard of the beets grown in the moister climate of Western and Central Europe.

The essentials in growing sugar beets are few but important. Our rich, loamy, well-drained soils, or what is known in the West as good corn land, are well adapted to their growth. Medium applications of well rotted manure, or better, rather liberal applications to a previous hoed crop, as corn, puts the land in good heart for beets. Much manure, especially if rank, is objectionable, as it makes the beets grow too large and woody. One of the most important points from the standpoint of saving labor is that the soil should be free of weeds. Nothing will discourage farmers from supplying beets to a factory more than trying to raise them on weedy land. Where crops are to be grown to supply beets for factories farmers should adopt a system of rotation in which two or more crops that can be kept strictly clean will be grown so as to require the least possible amount of the necessarily expensive hand-weeding of beets. Manures also should be well composted so that no weed seeds are added to the beet land in fertilizers. In the Western States, where most of the soils have subsoils of loam or "open" clay, comparatively shallow plowing is practiced for the ordinary grain crop. But for beets it is necessary to go deeper than the six to eight inches with the stirring plow. The beets want the land loosened to the depth of ten or twelve inches so that the roots will grow mainly beneath the surface. That part of a beet which grows above the surface is very poor in sugar. The plowing can be done either in the fall or in the spring, but the fall is doubtless preferable in most cases.

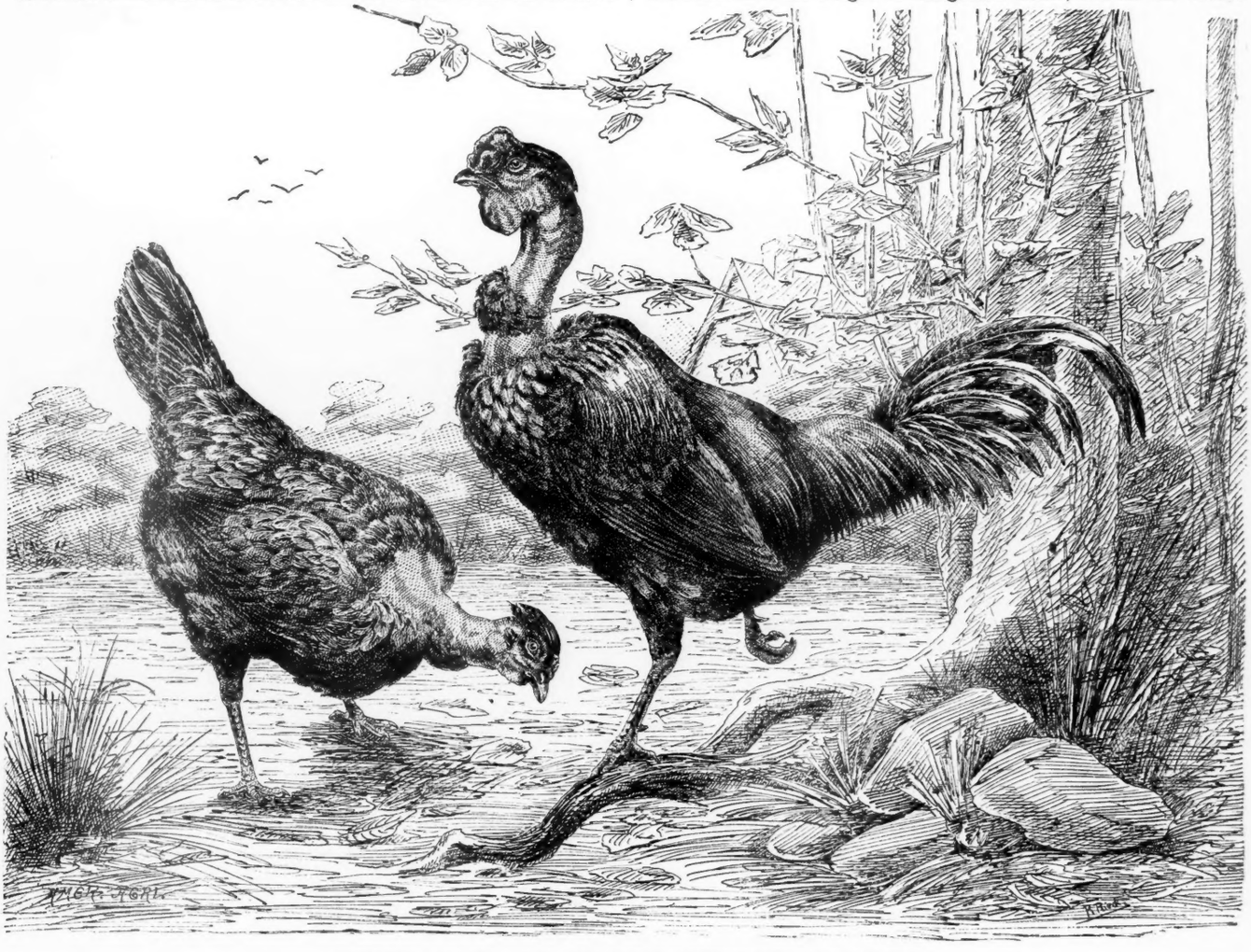
The seedbed should be made very fine and mellow to the depth of two or three inches, so that the seeding may be properly done, and so that the plants can be successfully cultivated close to the rows when yet very small, thus obviating so much hand-weeding a little later. The ordinary garden seed drills answer for sowing the seed, which should be sown thickly in rows only eighteen inches apart. Fifteen or twenty pounds of seed per acre is none too much. When the plants are a few inches high they should be thinned to one plant to every five or six inches in the row. This crowds them up so that the beets when full grown average only a pound each. Where land is so cheap as it is in most Western sections it hardly pays to transplant many beets unless the stand is very poor. It is economy to sow a large amount of seed, and then get the right stand by merely thinning when the plants are four inches high. The cultivation with hand-wheel hoes close to the rows should be commenced as early as possible, and between the rows also. This will make only a small amount of hand-weeding necessary at the time of thinning and at one later hoeing. If planted quite thickly, much of the thinning out may be done with a small hoe, drawing through the plants at right angles to the row. Planting the rows more than twenty inches apart, so as to allow horse cultivation in the middles, will probably pay, but there is no machinery in use by which the horse can be made to do the work of the hand-wheel hoe, the thinning hoe, and the fingers in cleaning out weeds around the small plants.

Accepting the proposition that the vast country mentioned is adapted to the production of sugar beets, the question comes, how are we to go at the business? Success will most likely be reached where farmers organize and, after having fully shown their earnest desire and their ability to produce supplies of roots sufficient for a factory, induce capitalists to invest with them in the enterprise. The country is thoroughly in earnest, and beet sugar will be produced in great quantities unless extensive experience proves it to be impracticable. This crop will add largely to the revenues of any section that will push it intelligently and perseveringly.

THE NAKED-NECKED FOWL.

The naked-necked fowl is one of the most peculiar productions of the poultry yard. In size it is about midway between the Leghorn and the Plymouth Rock. Its color varies, though black seems to be the predominant hue. But its great peculiarity consists, as its name indicates, in a neck bare of feathers, and the skin showing red, as naked skin on fowls usually does. Beneath the wings, also, are bare spots. In other respects the fowl is well feathered.

This fowl was imported from Germany a few years ago by Dr. M. Cook, of New York, an enthusiastic fancier of pigeons. After keeping it for a time, he disposed of his stock, as the writer has been informed, to Mr. A. F. Pierce, of New Hampshire. It is said that in Germany the fowl is highly prized as a prolific layer and as possessing excellent table qualities. Its naked neck does not seem to render it more liable to disease than are fowls with full hackles.



PRIZE PAIR OF NAKED-NECKED FOWLS.

Indeed, it is said to be peculiarly free from colds and ailments springing from colds, perhaps on the principle that keeps man free from such troubles when he wears a low-necked shirt like a sailor.

According to American ideas, the fowl cannot be called handsome. But beauty is an idea that is, to a considerable extent, dependent upon education, and it need not greatly surprise us to hear it asserted, as it has been, that in Germany naked-necked fowls are regarded as beautiful. It will, however, be a long time before we can so change our ideals that we can admire this strange appearing fowl. It will probably be bred by a few people who will keep it simply as a curiosity, and who will find in the surprised exclamations of visitors a sufficient reward for the care bestowed upon the fowl. Our engraving represents the prize pair of this breed at the recent New York Poultry Exhibition.

Geese are Healthy Fowls.—It is indeed surprising to many how very strong and vigorous geese are. Other fowls contract an endless amount of sickness and scores of good birds die from time to time. The goose remains vigorous and healthy, living well on food that other fowls reject, and standing intense, cold damp weather that other fowls could not possibly endure. On the farm the goose could be made a profitable as well as a valuable addition to the flock, and make up any deficiency in profit that the hens would from any cause fail to yield. It will be well to start a flock of a dozen this spring giving them at least a fair trial.

SELECTING BREEDS.

MISS. E. K. WINANS, NEW JERSEY.

There has been more nonsense written and believed about the different breeds of poultry than about any other branch of farm work, and that is saying a great deal. The relative merits of dark and light Brahmas are solemnly discussed; astonishing statements are made as to the weight of Langshans' bones, and all the virtues of all the breeds are claimed for some one especial sort. As a matter of fact, if the breed one has chosen is adapted to his particular line of work, and he has a good strain of it, it makes little difference which it is. The important thing is that he should hold fast to it through evil report and good report, whether it be the last new thing in Langshans, or the good old-fashioned Dominicks. At the last poultry show in New York, and at the Fat Stock Show in Chicago, last fall, the best fowls were found in some of the oldest classes, such as Black Polish, Partridge Cochins, and Dorkings.

Make a careful choice, in the first place, of a breed which is fitted to the purposes desired, and then never give it up until you have succeeded with it and "sigh for more worlds to conquer." Fickleness is almost always punished. The unstable farmer who sells his Leghorns because they fly over the fence, disposes of the Dorkings which he has bought in their place because they are subject to "bumble-foot," or substitutes Hamburgs for Plymouth Rocks because they are lighter eaters, will be apt to see the neighbors who bought his various despised fowls growing rich apace,

while he is still looking for the faultless hen. He is like the poor bewildered woman always at the mercy of the sewing machine agents, vibrating between "single thread" and double thread," losing money at each exchange, and forever learning new methods, while her steadfast sister is doing beautiful frills and tucks on a clumsy old machine. Aside from the weak-mindedness of it, "changing breeds" is a bad thing in that it keeps one from knowing the pleasure and interest of watching his poultry improve every year. Oliver Wendell Holmes says that the ideal human being ought to advertise for his parents ten years before he is born. Ten years of well nourished, happy, active ancestors will assuredly go a good way toward producing the ideal hen in any breed.

Of "general purpose" fowls there are the old-time Dominicks, their descendants the Plymouth Rocks; the Wyandottes, about which there was such a furor six years ago; Langshans; the captivating Houdans, and the staid Brahmas. Among the so-called market breeds, Dorkings, Houdans, Langshans and games, or crosses between these sorts, are considered the best flavored birds. Leghorns, Spanish fowls, Hamburgs and the Polish breeds are layers before all else. They do not bear confinement well, it is difficult to fatten them, and their flesh usually lacks flavor. But so much do the best specimens delight in producing eggs that they atone for all those faults to the egg farmer. The Red Caps are also excellent laying fowls, but their adherents, as a rule, prefer to have them classed among the "all around" breeds. The class in which Cochins belong depends entirely on the way they have been bred. They are generally good layers. There are also local breeds, such as the Jersey Blues, which are great favorites in certain neighborhoods. Dominicks, although they are of several colors, were in old times so generally of the same barred "dapple gray" as the Plymouth Rocks that old henwives often call the newer breed by the pretty, quaint name. They are pleasant looking, trim birds; the hens reliable, conservative layers, and unsurpassed mothers. There is little need to sound the praises of the Plymouth Rocks. Barred, white or black, they have, and deserve to have, a firm reputation. The Wyandottes are much like them in general qualities, but are rather prettier in appearance. Houdans, as bred in France, England and Germany are almost perfect fowls, but in this country they are the victims of fashion, small and feeble of constitution. Brahmas, long established favorites that they are, still grow in popular esteem. Those strains of Brahmas which have been bred especially as constant winter layers come very near perfection in the way of poultry. Langshans just now are in high favor. They are popularly supposed to have equally light appetites and skeletons. My own experience with them leads me to think that they eat more and lay less than Houdans or Plymouth Rocks. With either of those breeds, however, they make capital crosses. Dorkings lay particularly pretty eggs, well shaped and pearly white. There is a mistaken notion that all Dorkings are delicate. It is a pity, for this breed is one of the best possible, the flesh especially well flavored. The flavor of game chickens is also delicious. Games have a great fame as mothers, but theirs is the type of motherhood that tears other people's children to pieces. A game hen which I once was so unfortunate as to own tore the crests off three of my little Houdans in one week, and after that the fact that she could send any dog in the country flying did not save her from a fricassee. Rather a mild eyed Dominick or shapeless old Cochin who will cuddle the forlorn, lost chickling under her downy breast, than such high-spirited vixens.

CARE OF DISOWNED LAMBS.

H. CASSADY, KENTUCKY.

It frequently happens in the spring that one or more lambs in the flock are orphaned from some cause or other, and rather than permit them to perish we have them brought to the house and raised them by hand. Sometimes a ewe refuses to own her lamb, another will appear to think all the world of her offspring but will be unable to furnish a drop of milk for its subsistence, while a third perhaps dies, leaving her little one helpless and miserable. If the lamb is healthy when it is brought in it is always ravenously hungry, and before we learned the danger of overfeeding we lost one or two trying to satisfy their appetite. The first meal of cow's milk given to a lamb should be not more than one-fourth of a gill, which quantity may be gradually increased to half a pint given every two hours when the lamb is one week old. This is enough for a large healthy lamb; a small delicate one should have even less.

When very young, lambs are liable to be troubled with scours, in which case the milk should be boiled for one or two meals. If the opposite tendency is observed, a little white sugar or molasses put in the milk will generally prove a corrective; when it does not, however, a teaspoonful of castor oil should be given in the milk as often as is considered necessary. The milk must be perfectly sweet, as fresh as possible, and slightly warmed.

After two weeks the interval between feeding should be gradually lengthened, and the quantity of milk increased, as a robust lamb at the age of two months can take with impunity one and a half pints three times a day, and when three months old this quantity twice a day is sufficient. When the lamb is a few weeks old, if milk is scarce, half the quantity advised may be given, mixed with the same amount of well-cooked gruel made of fine corn meal or oat meal; and when this is done, in order to keep the lamb's digestion in good order, add to its food a tablespoonful of flaxseed jelly once daily. The jelly is made by boiling flaxseed in eight times its bulk of water for twenty minutes.

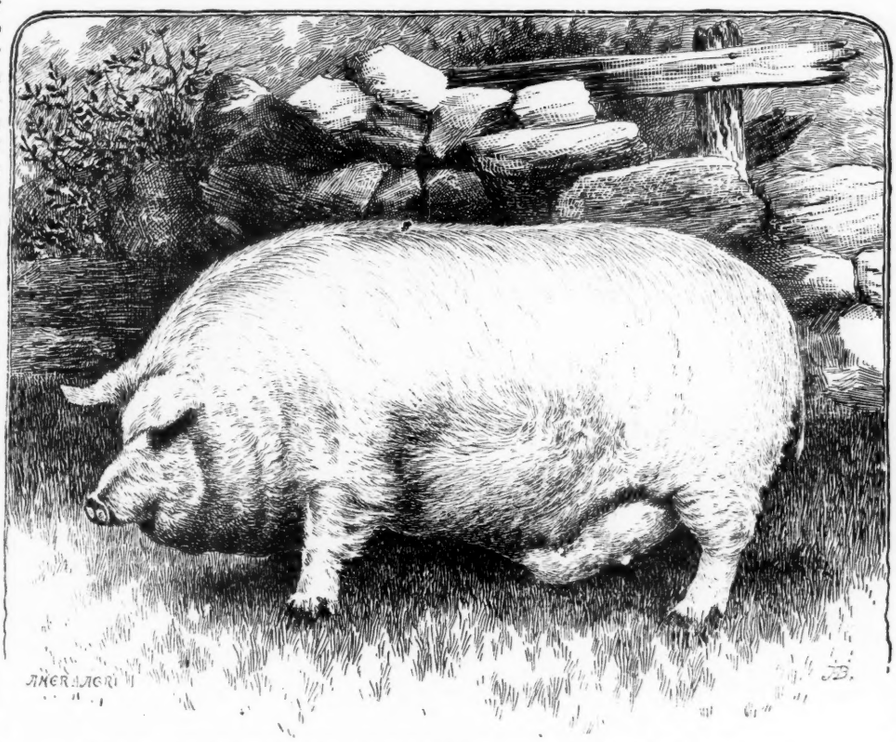
If the weather is very cold when the lamb is brought in, we keep it for a few days in a box in the back kitchen, where a big wood fire burns day and night. Here it lies and sleeps on the clean straw covered with an old blanket, only awakening at its regular feeding times, when it begins a piteous and plaintive bleat that stops only when its hunger is appeased. It is not long, though, before the little fellow learns to jump out of his box and then he goes frisking about, poking his inquisitive little nose into everything, searching for something to eat. Then, lest he run into the fire, I have to banish him to an outhouse, or on bright sunny days to the garden where he soon learns to nibble the rose bushes and tender shrubs in the dainty manner peculiar to sheep. This is one trouble with pet lambs, they begin to eat entirely too early, filling their stomachs with food they cannot digest. To obviate this to some extent, we continue to feed the lambs milk oftener and for a longer period than would otherwise be absolutely necessary. They are greedy little animals, and when allowed to come about the yard and kitchen rapidly acquire a taste for all sorts of things.

When I first began raising pet lambs I used to feed them from the bottle, which was a great deal of trouble; now I use the bottle and rubber only for a few days at first, and then I teach the lamb to drink by pouring the milk into a shallow pan and letting the lamb take one finger in its mouth, slowly immersing my hand in the milk until it is able to draw a little into its mouth. At first the little fellow is sure that he gets the milk from the end of my finger, but he soon learns better, and dispensing with my finger altogether, he plunges his eager mouth down into the pan of milk, and after lunging about awhile, feeling for something to take hold of, and half strangling himself, he settles down to business, and the milk disappears in a marvelously short space of time. I do not know that there is any real profit in raising lambs by hand. The milk they consume, and the time required for caring for them are doubtless worth more than the lambs themselves; still, rather than see them die, we always take them for pets. They make the most gentle and most interesting pets in the world, and we soon become so attached to them that the work of attending to them becomes a pleasure. They are grateful too, and repay our care with such quick interest, grow so fast and keep so healthy, that it seems but a little while that they need feeding so often.

Bees and Bee Plants.—The busy bees have worked their way into the good graces of the masses, and their sweet product is welcome upon the table everywhere. The apiary is not unknown to many counties of the older States, and in many townships there are several. The subject is so important that the leading farm journals devote space regularly to the subject. If all this is so it seems about time to begin to consider the honey crop as one to be planned for as much as for sorghum or maple sugar—for maple orchards planted for tapping are not rare nowadays. Some plants are pre-eminently honey or nectar producers, and it may be possible to grow these as a crop for the sake of furnishing a pasture for the bees. Prof. Cook claims that the greatest hindrance to bee-keeping is not "winter killing," or "foul brood," but lack of nectar. It is possible to depend upon wild flowers for a large share of the crop, and provide a pasture at the times when there would otherwise be dearth of nectar. There is a species of Cleome known as the Rocky Mountain bee plant that has been tested somewhat. Then there is the Chapman honey plant (*Echinops*). A mint (*Melissa*) has also been employed. The right plant may not yet have been found. Those experimenting in the apiary are doing a good work along many lines, and in time the bee pasture will be a thing to be admired for its beauty and its profit as well.

YOUNG STOCK IN SPRING.

Fully matured stock can endure violent changes of food with much less disturbance of the system than can young animals still growing. Therefore, specially good management is necessary in changing the young things from the dry feed of winter to the unripe grasses of spring. If the change is made suddenly an attack of scours will check their growth for a month perhaps. If ensilage and roots have been fed during the winter, the change to grass will not cause such disturbance as would occur in a change from dry hay, which is the usual ration of young stock on most farms. Such changes are best made gradually, and some dry feed should be given each day at the stable, or from troughs or racks at the pasture gate, until the grasses gain substance. Many farmers send their stock to the pastures too early in spring for the good either of the stock or the pastures. The ground when the snow has recently left it is soft and saturated with water. Turning cattle upon it at such a time is specially harmful to the grass roots. The deterioration of so many pastures can doubtless be largely traced to this practice. Many farmers turn their spring calves out to pasture during their first season. Though a few may occasionally thrive under this treatment, most of them come to the barn in the fall about one-half as large as they should be at that age. Stable care and feed, with a yard to run in during pleasant weather, but with free access to cover during the heat of the day, has been found by many progressive farmers to give much the best results. Skim milk, with a little oatmeal, bran, crushed oats, and clover hay, will give growth to delight the farmer's eyes, while the development thus secured is of the kind needed to make good dairy cows of the heifer calves, provided they are of good dairy blood. Lambs are not usually weaned until some time after they come to grass. With them, therefore, the change from winter to spring rations is not likely to cause serious trouble. But a small feed of bran or oats each day for awhile, after they go to pasture, will be well returned in extra growth. Keep the young stock growing thriftily.



THE PURE-BRED CHESTER WHITE—SNOWBANK.

CHESTER WHITE SWINE.

The "sham sample" fraud is a very mean one, from which the Chester White breeders suffered for many years, and in some localities the shadow of it continues to rest to some extent on the breed. It originated with unscrupulous men in Eastern Pennsylvania, who, taking advantage of the great popularity of the breed in its early day, pushed all sorts of mongrel white pigs on the market as "pure-bred Chester Whites." The victims of these frauds naturally lost confidence in the breed, and an idea became quite prevalent that it had no fixed standard. During all this time, however, the Chester White was a well-defined breed, which no one needed to mistake who had seen genuine specimens. All this was years ago, and it has now become as well established as any other of the recognized breeds of farm live stock. Societies have been organized to promote the purity and general interest of the breed, and herd-books are published with carefully authenticated pedigrees of the pure-bred members of the breed. The standard is strictly defined. An inspection of the accompanying illustration will give a more accurate idea of what a Chester White hog should look like than any amount of description. It is a portrait of the Chester White boar, "Snowbank," which received the first prize at the Chicago fat stock show last November. The animal belonged to Messrs. S. R. Price & Son, Williamsville, Ill., and weighed 506 pounds.

SPRING PIGS.

A. H. SHELDON, IOWA.

Many pigs are annually lost during April and May from lack of a little preparation for farrowing time. The sows are allowed to run at large until one day when the owner discovers a fine litter of pigs in the mud or wet straw; if not all dead, so near it that they soon die from the effects of such exposure. The better plan is to provide comfortable, dry quarters a month in advance, allowing the stock plenty of time to become accustomed to their sleeping places, giving them full freedom in the pasture or lots during the day, but at night shutting them up in their pens. From twenty-four to forty-eight hours before farrowing the sow will gather together the straw in the pen, and "make her bed." She will need plenty of water to drink at this time, and oats, shorts, or bran may comprise the greater portion of her feed. If the sow is feverish from constipation she will be very uneasy, cross, and possibly eat her litter as soon as farrowed. If any such disposition is shown, her cravings will be satisfied if given a good-sized piece of salt pork, when she will become quiet and probably do well. The little pigs will be inclined to lie together in a nest if not disturbed, and will not take the exercise they need. While the old one is eating her morning meal the little fellows should be stirred out of their heated nest, and made to scamper about the pen for a few minutes, until the bed has become cooled off.

At two weeks old they begin to eat and drink if a little place is made for them to creep into. At four weeks old they need plenty of milk in a little trough, so they will not depend altogether on the dam for their support. Allow the sow to run in a pasture by herself a portion of each day, while the pigs remain in the pen. As the pigs become larger they may go out with the old one, and will enjoy a run in the grass and sun. Feed for lean meat for five months, then fatten in four months, and get them up to two hundred and twenty-five pounds anyway, and as much heavier as possible.

HOW TO MAKE NEST-EGGS.

Porcelain eggs are too shiny, and their bluish tinge marks them as a palpable fraud, which no observing hen could bring herself to approve of. Perhaps the best nest-eggs are made of plaster, the surface and color of which closely imitate a white egg, and which will take readily any shade of cream or coffee color which a particular breed of hens affects. The following directions and sketches, furnished us by D. J. Tapley, New York, will enable any one to manufacture plaster eggs.

To make plaster eggs, take a box of wood or cardboard about three by four inches and three inches deep, and grease the inside with lard. Take an egg of the size you fancy and treat its surface to a similar coat. Now mix ordinary calcined plaster to the consistency of buckwheat batter, and fill the box a little more than half

full. Then take the greased egg, and press it into the batter till a little more than half submerged. Let it stand for half an hour, to "set," then slit the box if of cardboard, at two of the corners, and take out the block of plaster with the egg. Remove the egg carefully, cutting away a little of the damp plaster, if necessary, and cut the surface of the cast down evenly until the depression in the center represents a reverse half egg. Make two conical depressions

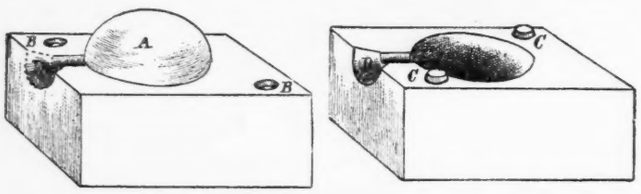


FIG. 1. PLASTER EGG MOLD OPEN. FIG. 2.

at opposite corners, like B and B in Fig. 1. Now grease the egg again and grease thoroughly the top of the plaster cast and the three depressions, put the egg in its original position in the plaster, as seen at A, Fig. 1. Put the plaster cast back in the box, tying up the sides in position with a string, or a rubber band. Mix some new plaster, and pour in till the box is filled. After allowing time to set, take off the last casting, and it will have not only an egg-shaped depression (E, Fig 2), but two conical studs (C and C) to hold it in position when the two halves of the mold are joined. Now cut a spout or funnel (D), and a corresponding one in the other half, and you have the two halves of your egg mold. Grease the inside of both halves and put them together as shown in Fig. 3, holding them in place by strings or rubber bands (F F). Now mix your plaster as before and pour in at the funnel D until the mold is full; let it stand for fifteen minutes, open and take out the casting, which needs only the removal of the stem and a little smoothing to be the best of nest-eggs. If you want more you can make them in the same mold, being careful to keep the inside oiled or greased, to prevent sticking. It is hardly necessary to suggest that of apples, pears, peaches, etc., for decoration or other purposes models may be made in the same manner.

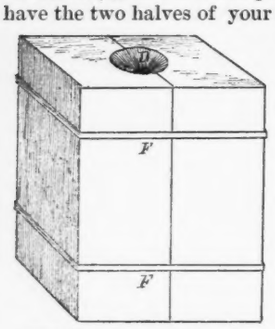


FIG. 3. MOLD CLOSED.

AIDS TO BETTER ROADS.

HOLLISTER SAGE, CONNECTICUT.

Were it not for the cost of handling by the expensive process of slow shoveling, gravel would be employed much more extensively in road making. Two cheap devices suitable for universal use commend themselves to the road builder. In practice they save twenty to twenty-five per cent of the time required for shoveling, while men and teams experience less fatigue than by the old-time process. The first help, shown in Fig. 1, is merely a platform of boards with cleats beneath, like a door, six feet long, having wings at the ends, which are held in an upright position by an iron rod

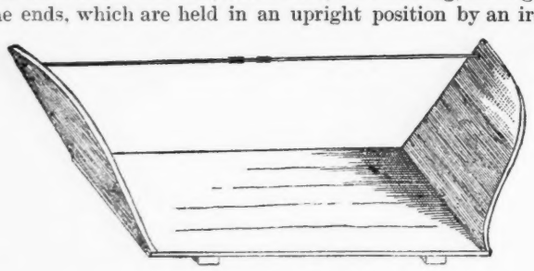


FIG. 1. WINGED PLATFORM.

running from one to the other. It is laid flat on the gravel to shovel on while working into the bank. By using a hoe the gravel may be cleared from behind it, a few inches at a time, and the platform pushed up. As the bank caves, it falls on the hard, smooth surface of the platform, and each shovelful may be taken up with much less strength and time than if shoveling in the bank with nothing to aid the edge of the shovel. The wings, projecting outward, catch additional quantities, and shoot it on to the floor for the shoveler. The second help is made in two ways, as shown in Figs. 2 and 3. Fig. 2 is a platform the length of a wagon box, or longer, if the gang of shovelers be large enough. It has legs in front that are high enough to raise it above the wagon. Its rear side rests in the bank. Men stand on it, and rapidly fill each wagon that drives under it, and without lifting any of the gravel. If the bank does not hang over this platform, the gravel may be expeditiously loaded by being thrown on it, and hauled off into the wagon by one or two men with large hoes. The other form of this device, Fig. 3, is built much heavier. Its legs are made in the form of braces so that it cannot be pulled toward the wagon, and instead of resting on the sloping bank, heavy legs support it. These are first buried in the gravel as a further protection against force. All this

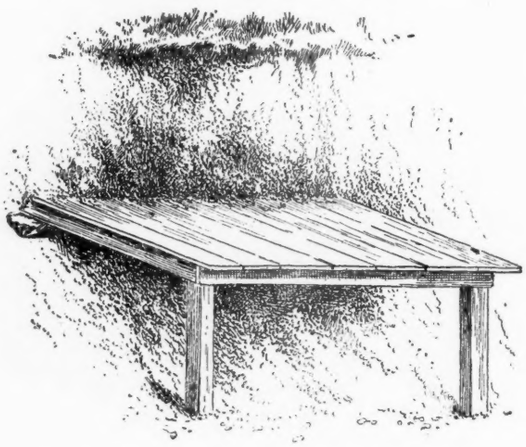


FIG. 2. PLATFORM WITH PERPENDICULAR LEGS.

precaution is taken because the wagons are to be filled by horse power; and an extra horse or team will be required. A common scraper does the work, but the team is not used on the platform. Its place is on the ground beyond the wagon being filled, and a heavy rope connects it with the scraper. A pulley on a convenient tree can be made to lighten the draught and elevate the rope above the wagon. With wagons enough to keep the scraper-team at work, highways may be very rapidly graveled, and swamps filled. Loose planks for sides and bottom should be used on the wagon instead of

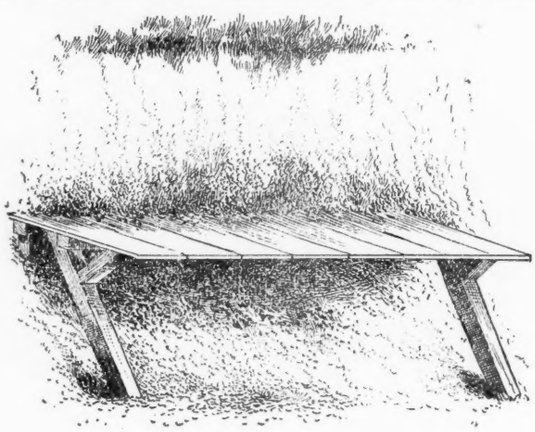


FIG. 3. BRACED PLATFORM.

the regulation box. These may be removed piecemeal, allowing the load to fall where it is wanted, without handling. Where a team and scraper are employed, the winged platform, shown in the first figure, will be found useful as a chute to lead the gravel from the platform to the wagon if the bank is high, or when it becomes difficult to get the wagon close to the platform. When road makers become accustomed to the cheap handling of gravel, the system of scraping up loam from the gutters for teams to wade through will be given up, and good country highways, better teams and larger loads will become common.

Keeping Farm Accounts.—Every farmer ought to know at the end of the season what work has paid him best, what work has paid least, and what has returned no profit whatever. We need more of business methods on the farm and less haphazard work—some of which is very likely carried on at a loss.

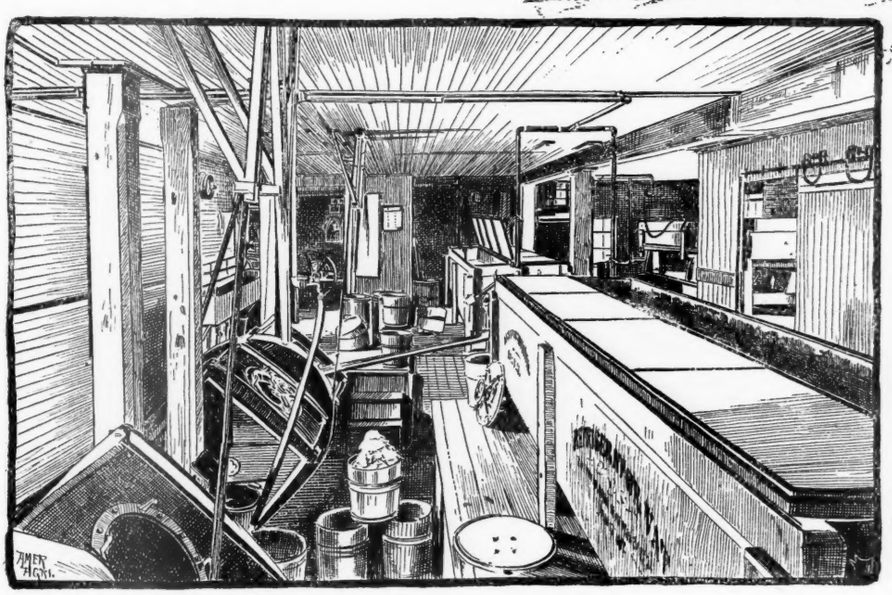
A MODEL CREAMERY.

W. E. PARTRIDGE, VERMONT.

Among the rapidly changing industries of New England the creamery is one of the last and most interesting. Its important position and eminent success make it particularly interesting at present. The "Allen" creamery, illustrated herewith, is one of the most recent and successful. It is located in North Ferrisburgh, twenty miles south of Burlington, and is owned by Bryden & Estabrook, of Boston, and was built and is managed by Hon. M. F. Allen.

The main building, once a cheese factory, is 120x30 feet. The icehouse and cold storage shown in the exterior view was added, giving a capacity of 60,000 pounds of butter and 175 tons of ice. There is an abundant supply of good, cold spring water, with head enough to carry it to the eaves. It is used under the cream vats for cooling, and by means of steam connections can be heated to any desired temperature at any point in the building. A ten-horse-power engine, with a fifteen-horse-power boiler, furnishes power, steam, and heat. The large boiler gives a good steam supply, even when the separator is at work. There are three "Danish-Weston" separators. One only is in the creamery. The others are in neighboring towns, and the cream is sent in daily. The creamery also takes the product of a cream route where it is raised by the "Cooley" cold deep-setting process. By these arrangements a larger territory is covered than would be possible in any other way. The "average haul" from the branches is five miles. In all its course the direction of the milk is down.

EXTERIOR VIEW.



INTERIOR VIEW OF CREAMERY.

Gravity takes it from weighing can to vat, and from vat to separator. The skimmed milk is delivered to a high tank, from which it runs to the patrons' cans. The cream flows to the cream vats, and when ripe down to the churns. This arrangement can be traced in the engraving. From the churns the buttermilk flows by pipes to a tank fifteen rods away in the house where the pigs are fed. There are two 375-gallon Blanchard churns, and a power butter-worker. The "twin cream vats" are by J. H. Russell, of Little Falls, N. Y., and have cooling and heating arrangements. Steam-pipes run all over the building, so that by hose connections boiling water, or live steam, is instantly available at any point. Neither pains nor expense have been spared to make the plant successful, yet the investment has been only $7,000.

In the best of the season the number of cows is 1,200. The run is from April 1 to December 1. In 1890 prices ranged from one dollar per hundred in April to fifty-five cents in July. In December one dollar and fifteen cents was paid per hundred pounds of milk. Milk is bought outright, but eighty per cent of skim milk is given back to the producer. The butter per pound of milk varies greatly. Variations are found which are unaccountable. Last year it took more milk than usual. The quantity varies with the stock, the feed, water, weather, etc. In the best of the season they made about 1,000 pounds per day. The product for eight months was about 130,000 pounds. For part of the season the butter is colored. The butter is packed in one-half pound prints, five pound boxes, ten, twenty, thirty, and fifty pound tubs. The prints go in thirty pound trunks.

One man at each branch, and two or three men at the creamery comprise the whole force. The churns start at 5 A. M., upon milk of the previous day. The separators start at 5.30. Milk is delivered but once per day. It is kept in cans over night, with covers off. They are cooled in warm weather. Sour milk is not used. The farmers keep from three to fifty cows, and the pastures are largely stocked with the short white clover. Milk is paid for by check—a safe and convenient way. The product of the creamery is always in demand, and is sold at the highest prices. This is a result which naturally follows good business management and a first-class product. The illustration of the interior gives a good idea of the arrangement of the apparatus. At the further end of the room, near the window, is the weighing can, with scales and platform. They are five or six feet above the floor. The driveway is high enough so that cans have only to be lifted clear of the wagon sides. The milk tank is in the further right-hand corner of the room. The separator is at the further end of the room, and is not shown. The double cream vats occupy the center of the room. The further churn on the left was being filled when the photo was taken. The cream spout is seen in place. Beyond the churns, and in line with them, are the engine room and engine. Both engine and separator are upon solid brick foundations entirely independent of the building. The boiler is in a small wing on the left. The sliding door on the left leads into the room where the butter is worked and packed. Out of this room a passage leads to the cold storage. All the counter-shafts are upon the second floor, so that all the belts lead up through the ceiling. The heavy posts by the churns and those beyond near the cream vats are for the purpose of strengthening the upper floor. At the same time the nearer ones carry the churn bearings.

The exterior view shows the north side of the building. The cold storage and icehouse wing is seen on the left. The photograph was taken just after the rush was over in the morning. Only a few of the wagons were lingering after discharging the contents of their cans. The boiler room wing is directly in the rear of the right-hand end of the building, and is, of course, hidden from view. The

ground slopes rapidly toward the south, giving good and rapid natural drainage. The soil is stiff clay, and practically nothing penetrates below the surface. All this is of importance because of the desirability of getting rid of all waste products as rapidly as possible. The driveway passes entirely around the building, going down on the right and coming up on the left. The milk is delivered under the shed shown on the right-hand end of the building.

CULTIVATION AND CARE OF BEANS.

PROF. WILLIAM W. TRACY, MICHIGAN.

Beans may be profitably planted either in hills running both ways, or in drills. On sod or other ground where weeds and grass are not liable to be troublesome, and on a farm run by a prompt and thorough cultivator, the best yields will probably be from planting in drills. The distance apart and the best quantity of seed to use will depend somewhat upon the variety used. The most profitable distance for early marrow pea-bean is twenty-eight inches, and about five-eighths of a bushel of seed should be used. The larger vined sorts, like marrows and kidneys, will need more room, and the marrows, because of the much larger seed, will require from seven-eighths to a bushel and a quarter of seed. The aim should be to have three to six plants in a hill, and a proportional number in drills. Many growers use more seed, often having from six to ten plants to the hill, but I am satisfied that a smaller number will yield more and better beans. I have known of a yield of over thirty bushels to the acre where there were only from one to three plants to the hill. An experimental crop may be put in with a hoe or by the use of common hand corn planters.

Many growers use the ordinary grain drills, stopping some of the tubes, but if this is done care should be taken that the seed is not injured by the drill, which will often crack or separate the bean inside the skin so as to ruin it for seed, and yet show no external sign of injury. Whatever device is used for planting, care should be taken to see that the seed is dropped into moist ground and well covered with soil, which should be firmed over the seed by some kind of pressure. About an inch is perhaps the best depth to cover, but I think more harm would result from a less than from a somewhat greater depth. In bean growing districts farmers almost universally use regular bean planters, and there is a great advantage in their doing so, for they not only put in the seed in the best possible way, but enable one to put in his whole crop at just the right time—a most important point in successful bean culture. With a good one-horse planter two rows are planted at a time, and from eight to ten acres per day. There are also two-horse planters used, which plant three rows at a time. As soon as the rows can be seen cultivation should be commenced—taking care not to cover or even throw much earth toward the young plants. The cultivator may, with advantage, be run to a good depth at first, but should be set more shallow as the roots occupy the ground, until at last only the surface is stirred. Often excellent work can be done by setting the teeth to cut away as close to the plant as possible and then within a day or two throwing the soil back to the plants, thus covering and chocking out small plants of grass and weeds which may be starting in the hill. But any "hilling up" of the plants, as was formerly the practice with corn, would be ruinous to the crop.

The cultivation should be thorough, and every effort made to develop needed nutriment and moisture, and prevent their being stolen from the crop by weeds. But the liability to injure the plants by cutting the roots, particularly on hot, dry days should never be lost sight of. So particular are many old bean growers on this point, that they will not cultivate at all during the middle of hot days, doing what they can during the morning and evening. Formerly, the only cultural rules, especially for beans, were not to cultivate when the plants were wet with dew or rain, and second to cease all cultivation as soon as the plants come into bloom. Undoubtedly cultivating when the ground is very wet, or carelessly throwing earth up and on the plants when they are wet, and cutting the roots by deep cultivation just as the plants come into blossom, will cut short the crop, but the injury by these means is only more noticeable at these times, and it is the way more than the time the work is done that does the injury. I would much rather cultivate during a slightly damp day than on one which was very hot and dry, and while I would aim to have all necessary cultivation over by the time the plants came fairly into flower, I would give a good surface cultivation later if I thought it necessary to prevent the crops suffering from want of moisture or from being smothered by weeds.

As soon as the pods are well ripened the crop should be pulled. This may be done by hand pulling and placing them, roots up, in small bunches, or they may be cut up by a long shared plow without a mold-board and then thrown into windrows or bunches with a fork. In bean growing districts regular bean pullers are common, but I have seen equally good work done by the use of the bean pulling attachments to some of the two-horse cultivators, particularly the Albion spring tooth. This latter implement is especially valuable in bean culture, because of the ease with which it can be set to give thorough surface cultivation close up to the plant, without cutting the roots. After pulling, the rows should be gone over and dug up with a fork, and in any case the windrows or bunches should be stirred after every rain, or as often as may be necessary to prevent the pods being long in contact with wet earth. As soon as the leaves and stems are fairly dry the crop may be stored. In doing this it is well to lay in rails propped up on the outside so as to admit air to the center, and keep the straw loose in the mow, and always care should be taken not to allow them to heat. Sometimes the season is such as to permit of thrashing direct from the field, in which case especial care should be taken not to allow the thrashed beans to heat in the bin, as they often will do. If the crop is stored, thrashing will have to be delayed until the straw sweats, as otherwise it will be almost impossible to get the beans all out of the pods. Thrashing is done by bean thrashers, by horse, and by hand. After thrashing, the beans should be looked after to see that they do not heat, and on the least indication of this they should be run through a fanning mill, which will usually check it. If it does not they must be spread and stirred every day until dry.

Beans are usually sold to dealers who take them at such a number of pounds to the bushel as will give them sixty pounds of hand-picked beans, and the price paid in Western New York has for the last few years averaged about $1.30 cents per bushel. One of the most extensive growers in the country gives the following as the labor needed to raise an acre of beans after the ground is fitted and ready to plant: Planting by man and team, one hour; cultivating by man and horse, two to four hours; hoeing (varying according to conditions), five to fifteen hours; pulling, man and team, one hour; man following puller and putting vines in shape, one hour. To this should be added the labor of turning the crop while curing, hauling in and thrashing. This last is done in Michigan by machine, for about five cents per bushel.

A BIG CORN CROP WANTED.

Indian corn is the great commercial grain crop of the country. A large crop means general prosperity. The farmer looks complacently upon his cribs, piled high with the golden ears which are to fatten his pork and beef, lift his mortgage, and tide him over to the next crop season. A good corn crop makes business for railroads and lines of water transportation, for elevators and commission men. Though only a small per cent of the corn crop is exported, it has a greater and more direct influence on the business and commercial interests of the country than any other cereal crops. Moreover, corn is nearly a general crop in this country. There is only a very small part of our immense area in which it cannot be grown successfully. Though corn is a gross feeder, for which the soil cannot be made too rich, it is not an exhaustive crop in comparison with the great weight and bulk of a large yield. The plant and grain consist largely of carbon, which they draw freely from the air. The farmer who raises good corn crops and turns grain and fodder into beef, pork, mutton, butter, and cheese, and saves all the manure, finds his farm growing richer rather than poorer from year to year.

The corn crop of 1890 was an extremely light one in consequence of a bad season, and before another crop is secured the country will be bare of corn. It will be well for farmers generally to prepare for a large crop this year; to plant sound, reliable seed in well prepared and fertile ground, and give it good care and cultivation. It is cheaper to raise a thousand bushels on twenty acres than on forty. The necessary cost of reliable seed, of thorough preparation of the soil, fertilizers, and good subsequent cultivation had far better be incurred than to produce half a crop on double the area.

Lime as a Disinfectant.—The common and indispensable disinfectant, fertilizer, and sweetener of pen, stable and henhouse is lime. After cleaning any of these places sprinkle a little lime over the floors. The application of lime as whitewash is indispensable. An addition of sulphate of iron and carbolic acid to lime as a disinfectant either as a whitewash, or for sprinkling over cleansed henneries, stalls, or stables, cellars of house or barn is made advantageously.

GUERNSEY CATTLE.

Of all the dairy breeds of cattle that Europe has furnished the world and that have become popular in the United States not one can claim greater honor in the line of its specialty than the Guernsey. The breeds of dairy cattle adopted in this country get their reputations as large, rich, or moderate performers, in a great measure, from the class of men who happen to adopt them here. The Jerseys and Holstein-Friesians are in the hands of wide-awake men who are anxious to push them to the front and have organized with this view, and with energy and persistence have made them perform wonders. The Ayrshires have more modest owners who are content to move along in a quiet and sequestered path, and to reap the benefits to be derived from an economical dairy race, and apparently not anxious to push it upon the notice of their fellow-men. The Guernseys have fallen into the hands of a class differing from both the others. They have thus far shown little desire for fame in large records of individual performers, at the same time they keep records, and some of them occasionally let the world know what their herds are doing, by publishing the yearly performance as butter makers, which is always an honor to the man who owns the herd. In other words, the Guernsey, as a general rule, is owned by regular commercial dairymen who make their living with their cows. The Guernsey is a special butter breed and is put up for work all the year round, and shows best when tested by herds, which is a good sign. That the breed comes from one of the Channel Islands, lying close to the island of Jersey, most of our readers are aware. There the Guernsey has been bred far beyond the memory of man, strictly in the line of making butter, and evidently selected with a view to developing those points that are thought to indicate the butter cow. In form she is medium, smaller than the Holstein-Friesian but larger than the Jersey or Ayrshire. Her limbs are large and strong, while her whole body looks as though it was put up for work rather than for good looks. In color she is light fawn and white, the "solid color craze" never having taken possession of her breeders. The color of the skin is wonderfully yellow as also is the milk and resulting cream. The butter seldom needs the addition of artificial coloring at any season of the year. Such in brief are the characteristics of this breed as we now find it in the United States in large numbers and increasing popularity.

While the "pride of family" fashion has not taken possession of the Guernsey breeders to that extent marked in the owners of other breeds, yet there is sufficient human weakness among them to point with pride to their family trees. The handsome specimens herewith illustrated belong to the aristocracy of Guernseys in two ways, one by blood and the other by performance. Squire Kent, No. 1,504 A. G. C. C., portrayed in Fig. 1, is a magnificent specimen of a Guernsey bull. In form he is just about perfect; in color and markings fully up to the highest requirements of fashion, while his disposition is quiet and tractable to a degree which, by the way, is a good characteristic of this breed both with the males and the females. This bull's sire was imported Squire of Les Vauxbelets 4th 771, A. G. C. C., and out of Anodyne 2d No. 2,489, A. G. C. C. The Hon. James James, of Guernsey, the largest breeder on that island, a judge at the Royal Agricultural Shows of England, says: "Squire Kent is not only the finest bull in America but excels the noted Rydale winner of the Queen's gold medal at the Royal Agricultural Show, of Windsor, England, and this is equivalent to pronouncing him the finest Guernsey bull in the world." Squire Kent is as perfect and magnificent a Guernsey bull as can be imagined. Gentle as a lamb, splendid in proportion. Orthodox yellow, with small white markings. Deep in the flank, with fine embryo teats. He should be a prize winner in any ring. His dam Anodyne is a twenty-one-quart cow, which is famous milking considering the extreme richness of Guernsey milk. The cow illustrated in Fig. 2 is imported Daisy, of the Rue 'al 'Or, No. 2,226. Her looks speak louder than words to tell of her value in a butter herd. Imported cows have to be judged by their individual excellence, as it is seldom that records are kept on the island. These representative animals are owned by S. P. Taber Willets, the proprietor of "The Old Brick" herd of Roslyn, Long Island, one of the famous Guernsey herds of America, where the cows are not only bred intelligently but are made to produce butter for market, every pound of it selling for fifty cents. In this way the working quality of the herd in kept up, while the males at the head of the herd have no superiors. That this breed is rapidly advancing in popularity is very apparent to the well posted, as the sales are kept up with greater regularity. There is a quiet satisfaction in the present-day manner of the Guernsey owner that gives assurance that he is perfectly satisfied that dairy farming pays especially with him.

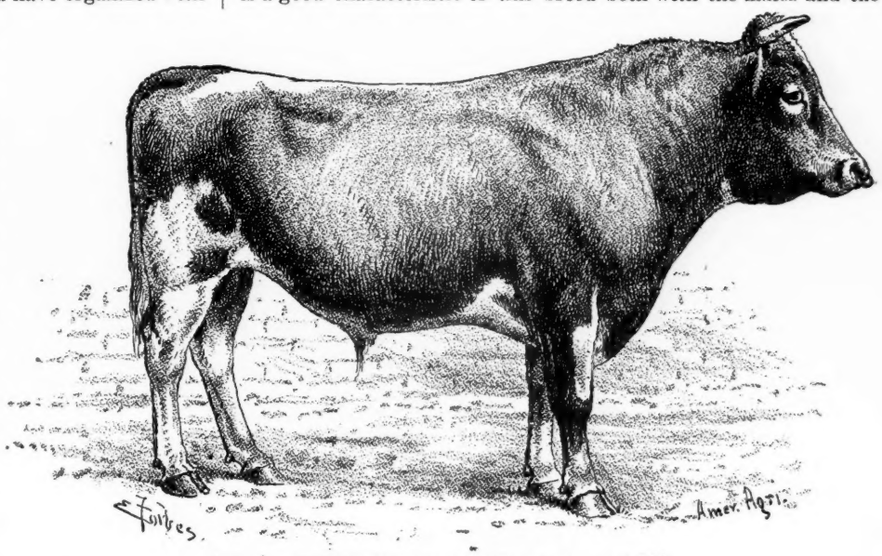


FIG. 1. GUERNSEY BULL SQUIRE KENT NO. 1,504.

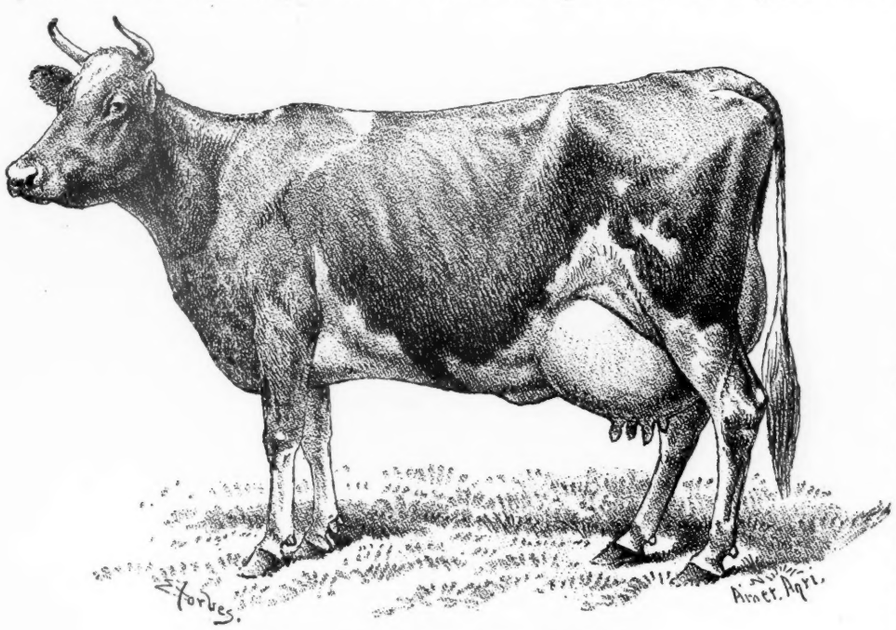


FIG. 2. GUERNSEY COW IMPORTED DAISY.

The Best Pay Best.—There is profit in really fine productions, be they butter, eggs, fruit, vegetables or meat of any kind. A gilt-edged article will sell at a good price in a glutted market. Care and the use of one's intelligence will produce fine articles.

EXPERIENCE WITH LAWN AND SHADE TREES.

A. S. FULLER, NEW JERSEY.

In making a selection of trees for a lawn, whether it contains a few rods, or acres, the planter should look ahead a few years and draw largely upon his imagination or practical experience in regard to how things will look twenty or more years later, at which time the owner may be a man who will not dare to cut out a tree when it is needed, or prune when they crowd. Grouping to produce the best effect is an art, born in some persons, and slowly acquired by others through study and long experience.

A lawn is supposed to be a plat covered with a sward, and where the grass is kept short by frequent cutting with scythe or lawnmower; consequently in selecting trees for grouping, or dotting here and there, in order to further enhance the beauty of the grounds, care is required so as to avoid planting kinds which may a few years later become an intolerable nuisance, although their beauty as specimen trees may be unquestionable. In grounds where anything like neatness is to be observed the grass must not only be cut short, but scattered leaves and twigs should be gathered up as they fall, and to do this on grounds of not very limited extent requires much labor and constant attention.

Confessing in advance my own want of forethought in this matter, it is possible that a scrap of my experience may be of value to those who are preparing to travel over the same, or similar ground. In seeking a spot for a home in the country a few trees or a goodly number of the same was thought to be of far more importance than a fertile soil, for fertility is a commodity to be purchased in our markets, but we must wait years for trees to grow unless fortunate enough to find them where they are wanted. I found an old farm which had been cleared for a hundred years, with the sole exception of an acre or two of rocky ledge, so worthless for other purposes that the poorest of the trees had been left to grow upon the little soil scattered among the rocks. The trees in this grove are mainly oaks, hickories, chestnuts, sassafras, and dogwood, and many of them are very old. My added lawn begins at the edge of this grove, and extends about twenty rods to the eastward, and on which there are many trees planted twenty-five years ago. In the autumn after one or two severe frosts the entire lawn is covered with the falling leaves from chestnut, hickory, linden, magnolias, and other kinds of trees and shrubs, all of which are gathered up and added to the compost heap.

But while these leaves are being gathered up the oaks of several species growing in the old grove, as well as some others planted on the lawn, retain their leaves, or let a few loose from time to time during the winter, or just enough to keep the place littered, and whirling into every nook and corner where they are certainly not wanted. The oaks upon the whole are a nuisance, anywhere and everywhere except in a forest where grass and neatness is unknown. The common beech with its persistent foliage should go with the oaks, in fact, no deciduous tree which will not drop its leaves with the autumn frosts should ever be planted on a lawn or about a dwelling house. There are so many better behaved and equally beautiful trees that we can well afford to discard all of those kinds with tenacious autumn foliage. The maples, magnolias, yellowwood, tulip, dogwood, lindens, liquidamber, papaw, persimmon, and most beeches drop their leaves within a reasonable time after frost, and after they are gathered up we can enjoy the green grass for several weeks before it is covered with snow.

It must not however be supposed that the various deciduous trees which drop their foliage in season are exempt from other imperfections, and are equally well adapted to the lawn. For instance, the chestnuts all bloom late in the spring producing an immense number of long yellow catkins, which are usually scattered by the winds over walks, roofs of buildings and elsewhere, littering and staining everything they touch, and unless a person is willing to keep a man, or more than one, climbing upon roofs, sweeping walks and raking the grass for a month during the blooming of the chestnut he had better plant his chestnut trees in an orchard or along the highways. The liquidamber is one of my favorite trees, always grand, but never more so than in autumn when its leaves assume the bronze tints, but with age come the seed vessels, swinging in the wind until spring then dropping in time to sink into the short grass, and clog the lawnmower when the men are in a hurry to make the lawn neat and tidy. They are almost too small to be picked up, and it is difficult to rake them out of the short grass. But the catalogue of faults of trees would be too long for these columns, so I will only give some evergreen trees a parting word. Those with large cones like the white pine, Austrian, and most of our Western species are admirable because the cones can be easily gathered as they fall, but beware of the Scotch pine, and others with small cones that are dropping all the year round with a few more to come on the first windy day.

FOUL BROOD—ITS CAUSE, PREVENTION AND CURE.

ALLEN PRINGLE, ONTARIO, CANADA.

The disease known as foul brood is the greatest obstacle, at present, in the path of the apiarist. Like so many other contagious and infectious diseases, it is caused by a microbe attacking the young larvae which it destroys and converts in the cell into a rotten mass of brown, ropy matter, very offensive in smell in the advanced stages of the disease. The sunken cell-cap with a small aperture in the center in connection with the foul contents indicates the presence of the disease. Usually there will be more or less healthy brood adjoining that which is diseased, but the colony dwindles and loses heart in proportion to its type and extent. It is now pretty well settled that this disease sometimes, if not always, originates in brood that has from some cause died in the cells and become decomposed. Hence, to prevent the disease originating in this way every bee-keeper should studiously avoid the causes of dead brood by keeping all colonies strong, warm in spring and well supplied at all times with stores; and also drop the practice of decapitating the unhatched drones in the combs, and leaving them to be carried out by the bees, or to rot in the hives. The disease, once started, is undoubtedly spread through the medium of the honey, and possibly in other ways, though that is not yet established as a fact.

Various remedies are used with more or less success in the treatment. Prominent among these are salicylic acid and absolute phenol. But none of these can be depended on for a thorough cure. Foul brood can, however, be cured without the use of drugs. This has been amply demonstrated in the province of Ontario the last season. The disease was making alarming progress, and we succeeded in securing from the Provincial Legislature an "Act for the Suppression of Foul Brood Among Bees" to aid in extirpating the pest from the province. This Act provides for the appointment of a foul brood inspector and deputy whose duty it is to inspect apiaries in any part of the province where sent, and deal with the disease wherever found, either by treatment, when curable, or cremation when incurable. It makes it a penal offense to resist him in the discharge of his duties, to sell diseased bees, or tainted appurtenances, to expose infected things which might cause the spread of the disease, to conceal the fact of having the disease, etc. This Act has worked admirably, and every State in the Republic ought to have a similar law.

The treatment is simple and hygienic in character, and is practicable in all movable comb hives. In the evening remove the bees and queen from the diseased colony, and place them in a clean hive with foundation-starters in the frame. Four days afterward take away all frames of comb and starters from them and give them full sheets of foundation, or empty comb which are known to be free from the taint of disease. The colony is now cured and will rear brood, healthy and free from the disease until contracted again through the ingathering of diseased honey, or otherwise. The honey is the chief, if not the only, medium of the contagion, and one drop of infected honey brought into a healthy colony, if used for larval food, is sufficient to start the disease. The diseased honey may be rendered innocuous by boiling, and the combs by rendering into wax, the dross to be buried. To save the healthy part of the brood taken from diseased colonies, leave enough bees to cover it, or give it to queen bee colonies; and as soon as the healthy brood is all hatched, put the young bees through exactly the same process, give them a queen, or a cell, and they, too, are cured.

Depth to Plant.—No arbitrary rule should be followed. In a cold, wet soil the seed should be put near the surface; in a light, sandy soil deep planting is proper. In parts of Colorado and Kansas corn is often planted ten to twelve inches deep—a depth equivalent to burying for good in the ordinary soil; but in these very dry, sandy soils such deep planting is necessary. As a late spring makes the ground colder and wetter than usual, it is plain that the depth to plant varies with the season. When the season is unusually dry the planting should be deeper. Oats should have a shallower covering than wheat, corn should be covered deeper than wheat, and potatoes deeper than corn. Only finely pulverized soil should be placed over seeds.

THE FAMOUS JUMPING HORSE, FILE MAKER.

The circumstance which made File Maker famous was this: The chestnut hunter Leo was a stout cross-country horse up to heavy weight and safe beyond peradventure as a jumper. Another well-known hunter, Hempstead, was his rival, some believed his superior. At the fifth annual exhibition of the National Horse Show held in the Madison Square Garden, a special prize of $100 was offered to any horse breaking Hempstead's jumping record, which was six feet eight inches. The contest was narrowed down to a trial between Leo and File Maker; previous to this attempt Leo's record was six feet three inches made in 1884. Peter Smith, Leo's jockey, made the first offer at a height of six feet, nine and seven-eighths inches. The gallant old chestnut measured the top rail, gathered himself for the final effort, rose and cleared the bar with the ease and grace of a deer. Next was File Maker's trial. The younger horse, ridden by his Canadian jockey, W. A. McGibbon, also surveyed the leap before him but with a less accustomed eye. In fact he balked at the first attempt but cleared the obstacle on the second offer at the same height but with less ease. Since this date Leo died and File Maker has surpassed himself. At the Exposition Building in Chicago, on the 22d of November, 1890, File Maker cleared a bar set at seven feet two and one-half inches, to do which he had a run of rather less than thirty yards. Tom Potter was the rider. With these facts in view it seems well worth the attention of breeders to produce saddle horses of this type. To all versed in field sports File Maker has the conformation of a first-class weight-carrying hunter. His expression is good, being full of intelligence. His hindquarters are powerful, bespeaking great lifting capacity. The spine has the slight droop toward the tail so marked a feature of the British cross-country horse of a quarter of a century ago, before the present frequent crosses of thoroughbred blood had developed in this branch of the equine family the straight spine of the Anglo-Arabian. The recent taste among us for the British hackney affords American breeders of saddle horses a ready road to success, as a strong, closely-put-together dam of the best hackney class, crossed with a well-tempered strongly-built thoroughbred sire, could not fail to produce excellent saddle horses where ease of action and perfect safety across country combined with stoutness of constitution and evenness of temper are of more value than unusual speed. Such a cross would also insure a goodly share of beauty sufficient to attract and certain to please the most fastidious of cross-country horsemen.

FILE MAKER THE CHAMPION JUMPER.

Paper Horseshoes.—Shoeing has crippled more horses than have been crippled by going unshod. To save the delicately formed and sensitive foot of the horse, encased by Nature in a casket of horn, has been the study of many a humane mind. For ages, the horse's foot has been armored in iron—steel-clad. Almost every kind of shoe has been devised, and made of almost every substance. Leather, rubber, and felt, have been found wanting. Iron shoes have been fitted to the horse's foot, and the foot fitted to the iron shoe. At one time it was believed that a rocker shoe could increase the speed of a trotter with a record of 2:17¼. But it has rocked every horse shod with it completely off his gait if not off his feet. If carrying weight on the back has defeated many a horse in a race, the carrying weight on the feet has defeated very many more. With paper horseshoes, light, elastic, perfectly fitting the feet, may we not anticipate for the racer 1:30, and for the trotter two minutes? May we not hope that bad and crippled feet of our horses will become, happily, very rare? Let us have a thorough and complete trial of the paper shoe. It is to be hoped that it will prove the best material yet used for shoeing horses.

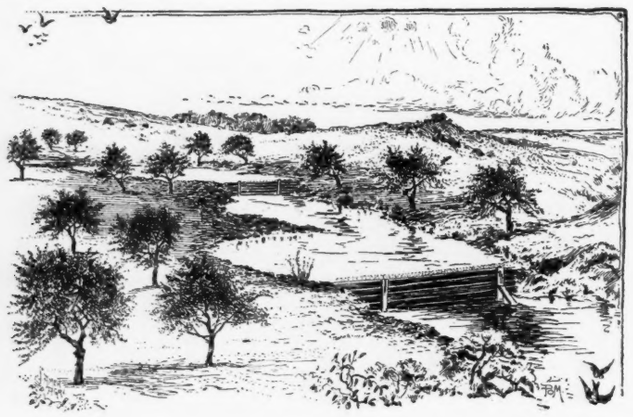
WHEN TO CUT GRASS FOR HAY.

J. M. TROWBRIDGE, NEW YORK.

During many years of careful observation I have noticed that grass is rarely cut for hay at that stage of growth which is most relished by grazing stock; that the cutting is almost universally deferred until it has attained a degree of maturity which causes grazing stock, if they have a choice, to avoid it, in their preference for a less mature or younger stage of growth. Everybody must have noticed the patches in pastures where the grass has matured, and how sedulously it is avoided. Concurrent with this had been the observation that great gain in flesh and fatness, health and strength of grazing stock was made mainly during the season of those stages of growth preceding the common "haying" season, and that stock put to grass after the maturing of the crop "fit for haying" rarely made any great gain, and never such gain as is made when such stock are put upon the young grasses of the early spring. Compare a cow from an August pasture with one from a pasture in early June. See with what difference they fill themselves! Notice the difference with which they fill the milk pail. Very few grazing animals on grass all the season maintain in August the flesh gained in June.

These facts had produced with me an impression that earlier cutting of the grass would be better. Just then appeared, at a winter meeting of the New York State Agricultural Society in Albany, a farmer from Vermont with samples of winter-made butter. It had all the characteristics in color, in flavor, in fragrance and other qualities of the freshest of May or June butter. After unanimous approval, the question was raised, how was it produced? What feed is used to make spring butter in midwinter? The maker replied that the stock from which the butter had been made had been kept exclusively on hay and water. Conjecture then naturally turned to the direction of artificial coloring and flavor. To such intimations the maker made a simple denial. His cows were fed only on hay and water, and the butter was produced from their milk in the ordinary way: no coloring, no flavoring and no adjuvants of any kind were used. At length after much banter-

ing and badgering the maker explained. "My hay," he said, "may differ somewhat from the ordinary article. It is cut at the time when stock seem to relish it most, and gain on it most rapidly. I do not see why timothy straw should be any better than oat straw or wheat straw, and that is what your grass becomes if you let it go too far. I cut my grass long before it is heading, not to say blossoming, and as it has then formed no seed it does not exhaust soil. But at the same time it has formed no fiber to be masticated and digested without affording nutrition. All its weight then is nutriment. True, I do not begin to get the yield per acre then that



A FARM FISH POND.

would be obtained by waiting until the seeds had matured and the stalks become wood straw; but for this same reason the roots, still in their vigor, send up new shoots, tiller out, and produce a second crop by the time of ordinary haying. Ordinarily, I get three and four cuttings per year where I should obtain but one were the grass allowed to mature its stalk and seed, and these three or four cuttings always weigh more than the crop would weigh if matured in the ordinary way."

There is another consideration in this connection worthy of entertainment. Daisies and carrots are the bugbear, the terror of hay growers. They must seed the second year or die out. Cut three or four times every year, they will inevitably disappear, and with them many other weeds. Grass, cut early, before forming headstalks, needs curing differently from ordinary hay. It must be cured in the cock to get the full benefit of all its qualities. Drying in the sun will certainly powder its tenderest, most succulent and juicy parts, and thus waste its most valuable properties. It should lie exposed to sun no longer after cutting than sufficient to dry off the visible dew. When properly cured not a leaf will break in the hand. It will be soft, pliable and sweet smelling. In these days of mowing machines three or four cuttings will cost little; while the increased production over a single cutting, together with the higher nutritious quality of the product and the repression of weeds, would seem to make this plan much preferable over the ordinary one of haying timothy straw.

SALMON TROUT CULTURE ON THE FARM.

WEBB DONNELL, MAINE.

As large a proportion as possible of the food that is consumed on the farm should be produced on the farm. Not only should this be done, but it is unquestionably true that this home production ought to be much more varied in its character than is usually the case. Mutton, lamb, turkey, duck and chicken ought to be a frequent article upon the farmer's table, as well as beef and pork. It is also possible under certain conditions to have a supply of food fish to still further vary and add to the bill of fare. Of course a pond or stream is an essential factor in securing these. In this connection the practice of a gentleman in my native town in the farm culture of salmon trout might be profitably adopted by others. A small stream of water ran through his field, passing within a few rods of his house on its way to a neighboring river. This stream he dammed at successive points along its course, thus forming a series of small ponds, along whose banks and on the slopes facing them were thrifty apple trees. Those that overhung the edges of the ponds afforded a grateful shade for the trout below, a fish that is specially fond of shady nooks. To prevent the fish from escaping, barriers were placed across the stream both above and below the limits which were allowed them. Tight dams with a grated outlet may be used for this purpose. Over such a grating of wood a piece of galvanized wire netting may be placed, of the very fine mesh that is sold for cellar windows and other openings. In this way the escape of even very small fry would be prevented.

To stock such a stream the most expeditious plan is to secure a quantity of eggs from one's State or from the United States fish commissioners. Then hatch them in water of the proper temperature and liberate them in their future swimming ground. The succession of ponds is valuable for several reasons, both in affording a succession of feeding grounds for adult fish, and because the newly hatched stock can at any time be turned into an empty pond where they will not be disturbed by their older and somewhat ravenous relatives. Unless the number of fish is regulated to the size of the stream or ponds, food must of course be supplied. The gentleman whom I mentioned fed his trout largely, if not wholly, on milk curds, throwing them into the water, when a most interesting rushing and leaping would take place on the part of the finny tribe. This, however, was an attempt to rear trout in marketable quantities. But for those who wish to raise them simply for their own table it is best to make a succession of ponds to increase the feeding ground in the vicinity of one's house, since poachers are sure to get in their work, if they can be concealed from sight while doing it, and also to provide a safe place for the young fish. It can soon be demonstrated how large a number can be accommodated in the space reserved either with or without feeding. It will be found more of a pleasure than a trouble, however, the throwing of some stiff curds to the trout, occasionally, thereby insuring increased size when they come to the table. Our illustration shows a series of ponds and dams as described.

Dried Beet Pulp.—Probably this feed-stuff will turn out, as dried brewers' grains did—too expensive for profit. But there is this advantage in storing beet pulp over brewers' grains, they keep infinitely better in properly prepared pits. When our beet industry is fairly under way, the pulp can be preserved for feeding purposes the year round, and will prove one of our most valuable by-fodders. As the Government bonus of two cents per pound on all manufac-

See Wat Yuen. Tong Kee.
January The Leab Price 1891
Mrs. Lindsay & Co.
100# Cabbage # 2.00
100# Potatoes # 1.80
100# Parsnif # 3.00
100# Squash # 4.25
100# Onions # 3.50
100# Beets # 1.75
100# Carrot # 2.00
100# Rita Baga # 1.75
100# Turnif # 1.25
One Dozne Ponge Celery # 85¢
One Dozne Ponge Parsley # 30¢
One Dozne Ponge Onions # 30¢
One Dozne Ponge Spinach # 40¢
Helena Montana City

FIG. 2. CHINESE GARDENER'S PRICE LIST.

tured sugar will immensely stimulate production, consumption will be proportionately great. In foreign countries there is a heavy tax on beets, yet France, Germany, Belgium, and Holland produce large quantities of sugar and molasses from them annually. The sugar, molasses, and spirit from beets will take care of themselves. But the by-fodder of beet pulp should be utilized in the production of milk and meats. If exclusively devoted to pig-feeding, it would solve the problem of profitable hog-raising. Greater and more beneficent still will prove the beet pulp as a partial substitute for corn. And, of course, this will send the surplus corn into other channels of profitable uses.

CHINESE TRUCK FARMS IN MONTANA.

REV. F. D. KELSEY, D. SC., MONTANA.

The Chinese at Helena, Montana, vary from three hundred to eight hundred, according to the season of the year. Of these, in and around Helena, about fifty are engaged in gardening, and these vary among themselves, from those having little gardens of a fifth of an acre up to twenty and thirty acres; and from those who ride into the city in wagons to those who walk, carrying their produce in two large baskets strung on a pole suspended on their shoulders.

FIG. 1. CHINESE TRUCK FARM "HARD DIGGINGS."

The latter class trudge along in an indescribably ludicrous trot, but one which is efficient in getting them over the ground at a pace far exceeding the usual rate of men bearing a burden. About Helena Chinamen have nearly monopolized the small gardening business: yet because of the heavy demand for these articles good prices are maintained. Helena, like many of our other large towns and mining camps, is supplied with produce in two ways; street peddling, and the stores. Street peddling is almost entirely given over to the Chinese; and the stores are supplied by the railroad, or by Chinamen, and the ranchmen who exchange produce for goods. Ranchmen are more apt to bring in butter, eggs, and potatoes than other products; but as for celery, onions, cabbage, lettuce, carrots, turnips, spinach, parsnips, radishes, peas, beans, sweet corn, squashes, asparagus, tomatoes, parsley, greens and onions, the Chinaman is our last resort, nearly our Hobson's choice, unless we take what has been sent in by freight or express from the gardens of Minnesota, Utah, Oregon, or California. The amount taken from a small piece of ground is astonishing. In our Chinatown, which is within the city limits, with houses thick all round about them, two Chinamen cultivate a piece of ground not more than a fifth of an acre. No white man could raise enough off of it to pay the rent, but these Chinamen not only pay a high rent, but toil on satisfied with their gains. But little information can be obtained from the Chinamen as to their gardens, methods, and plans. They look upon a questioner as one who desires by his questions to entrap them, they know not how or why, but they feel sure there is something wrong somehow. The dates at which Chinamen, at Helena, supply dealers with vegetables are, according to the books of one of our largest wholesale and retail houses, as follows: March 12, spinach and green onions. March 26, lettuce. April 25, radishes. May 1, rhubarb and mint. May 15, parsley, asparagus. May 30, beets, carrots. June 15, turnips, peas. July 1, stringbeans, celery, cauliflower, gooseberries, potatoes, cabbage. July 15, cucumbers. Aug. 1, corn. These dates are from seven to fourteen days later than they ought to be, for the Chinamen find ready sale for all such things at private houses, when the first are produced. The earliest vegetables are raised under glass. Each Chinese garden has more or less space devoted to covered hotbeds, and great care is taken of them, the general management being the same as that adopted by American gardeners.

The field culture is somewhat peculiar and adapted to a land where rain seldom falls. Everything under cultivation must be so arranged that it can be irrigated. Where less than half an acre is under cultivation, the Chinese use hand sprinklers, or pay for city water conveyed by a hose. But where they work several acres, they bring every inch under the highest state of cultivation and obtain water from a creek. They rent a few acres from some man who has an unquestioned legal water right, survey the land carefully, and bring the water in a ditch to the highest point of the patch. From there they conduct the water in smaller ditches anywhere they wish, the whole patch being platted out as regularly as city squares and streets. Each plat is wide enough to be reached half way across by the gardener on one side and by his hired man on the other side. The water is run into these ditches and little side branches, and from them to the vegetable beds to soak in until the whole is thoroughly wet, when the water is turned off to another bed, and so on until the whole field is well watered. This requires the time and labor of one or two Chinamen on a large place; but the hot Montana sun and long days, combined with an abundance of mountain water, produce results that would astonish Eastern farmers.

Montana soil is naturally rich, but it takes Chinamen to put on the manure; their vegetable beds appear to consist principally of compost of stable manure which they get for carting it away. As a rule, these Chinamen are persistent enemies to weeds, and most of their gardens are as clean of weeds as the typical New England housekeeper's home is free from dirt. Yet, to my astonishment, I found one Chinese garden very full of weeds. The very worst garden was one on made land, formed by damming up a rivulet from a placer mining works, and so catching the soil held in the water: this forms soil on top of a rocky, abandoned mining claim, and several Chinamen gain a livelihood therefrom. This garden may well illustrate the struggle for existence, and the survival of the fittest, and so be called "*Hard Diggings*," a view of which is presented in Fig. 1. The rents paid by Chinamen are enormous. They take from three to ten years' lease and pay twenty-five dollars per acre, in lots of ten acres or more. Those who rent smaller tracts, pay proportionally larger rents. I have been fortunate in securing for this article a price list of goods, of one of these Chinese gardeners, in

FIG. 3. CHINESE FARMHOUSE AND DOORYARD.

English and Chinese. A photographic reproduction, reduced one-half is seen in Fig. 2, and also a notice which is posted over Chinamen's doors on New Year's Day, Fig. 4, to show that all debts have been paid for the preceding year.

Fig. 3 presents an interesting view of a Chinese gardener's house and dooryard. On the front post is meat hanging in strings to dry, while all round about are to be seen wood, barrels, cans, grindstone, boxes, and baskets. Not seen here in the picture but very near by, were carts, wagons, manure heaps, chains, shovels, hoes, rakes, and all manner of barnyard implements. Taken all together the picture is one of indescribable confusion. Sitting in the open door (Jan. 16, 1891) was a Chinaman grating horseradish and weeping over it as over some deceased loved one; beside him was a Chinaman doing housework and odds and ends, who had on his naked feet naught but a pair of Chinese open slippers, presenting anything but a prepossessing appearance. They rent some fifteen acres of land at $25 per acre annual rental. The two large engravings illustrating this article were drawn after photographs expressly taken for the purpose by Mr. Leslie Sulgrove, city librarian of Helena, Montana.

FIG. 4.

TOBACCO—PLANTING AND CULTIVATION.

W. F. ANDROSS, CONNECTICUT.

Preparing the Ground.—In preparing the ground for tobacco, the smoothing harrow should be used until the soil is perfectly fine and smooth. Then the field marker should be employed, making the rows or drills straight and three and a half feet apart. If any "starter" is to be used, it should be sown in these drills or marks, say from four to six hundred pounds per acre, and covered with the "ridger." This will make a smooth, flat surface on which to set the plants, the following-wheel of the machine marking the spaces between the plants from twenty-two to twenty-six inches, as desired.

Setting the Plants.—Seed leaf should be planted three and a half by two feet. This gives nearly six thousand plants per acre, and usually it takes one thousand laths to hang it. In calculating the space in the sheds, this number of laths may be set down as the rule for an acre. Havana seed needs to be set much closer; rows three feet apart, plants eighteen to twenty inches in the row. Nine, or even ten thousand plants are often set on an acre. Even with this increased number of plants it is seldom that the weight per acre of this variety equals that of seed leaf, though it may in exceptional cases. Eighteen hundred pounds per acre is a good weight for Havana, while two thousand pounds is considered the standard for seed leaf in the best growing districts. A very important point in planting is the proper handling of the plants when taking them from the seed bed. Unless the day is cloudy this should be done in the morning, or toward evening. The bed is first thoroughly soaked with water that the plants can be pulled up without injuring the roots. When a handful is obtained the roots should be dipped in water and the bunch deposited in a "flat" or shallow box, roots all one way, leaves up, and the box set in a cool, shady place till wanted. Plants may be kept a day or two in this way without disadvantage, but they should not be allowed to wilt. The roots should be placed straight and the earth pressed evenly and closely around them, and unless rain has immediately preceded the planting, or is falling at the time, they should be at once watered. If the weather continues dry they should be watered again on the following morning, which is generally sufficient to insure a good start. Where cutworms abound the plants may be sprinkled with Paris green and plaster in the same proportions that would be used on potatoes. This can be done rapidly and easily, and is a sure preventive; and has the further advantage of preventing the plants from being burnt by the hot sun.

Cultivation.—Tobacco should be hoed out, and the crust broken around the plants as soon as the start is assured, generally within ten days from setting, and again in about the same interval. Frequent use of the cultivator is beneficial, especially in a dry time, and the cultivator should be used even after the plants attain considerable size, especially if heavy rains have rendered the surface hard and compact. Fertilizers may often be applied to advantage during the hoeing. If the start is not satisfactory or the field is backward, from two to four hundred pounds per acre may be used. Sulphate of ammonia, or nitrate of soda (not over two hundred pounds per acre) is very active, and will generally show immediate effects; but great care should be used not to let any of it touch the leaves in the application. During this part of the growing season little is to be done to the crop beyond the use of the hoe and cultivator. If green worms abound, a careful search once or twice a week should be instituted, as any neglect will cause much damage where the crop of worms is large.

Topping and Suckering.—The plants should be topped when the bud begins to show color or the blossom begins to appear. Fourteen to sixteen leaves should be left to mature on a plant of ordinary growth in seed leaf, and somewhat more in Havana, as the leaves set thicker in this variety. A few days after topping, the top suckers begin to appear, and these should be removed before they become woody. Seed leaf should stand from two to three weeks after topping before it is cut; Havana from three to five weeks. Indeed, there is little danger of getting the latter too ripe. A few days before cutting the plants should be suckered from top to bottom, and every sucker two inches long broken off. In a very heavy growth of tobacco it is sometimes necessary to sucker it as it is cut.

GRAINS OF CORN.

Tile drains are good manure for corn.

There is profit to every corn raiser in a special seed patch.

Corn for ensilage should have just as much care in planting and cultivating as field corn.

Look out for the corn-worm, and when it appears take prompt measures for its destruction.

The variety is important, but the best variety can make only a poor crop with poor cultivation.

If corn ground is rolled either before, or after planting, the harrow should follow close after the roller.

About one-half the work of cultivation can be done, and done most easily and effectively, before the corn is planted.

Fine earth is a good mulch for corn, and is most economically supplied by a frequent stirring of the soil with a cultivator.

Whether for silage, or for grain and fodder, the man with clean land can grow the most corn with the least labor, by planting in drills.

It very rarely, if ever, pays to stir the ground when it is very wet. In unusually rainy weather it is better to use the hoe and scythe than the cultivator.

Brace-roots are not different in construction or office from the roots starting underground. Hence, deep, close cultivation destroys valuable root growth.

Two hundred and fifty-four bushels of shelled corn have been raised on one acre of ground by Col. Drake of South Carolina. Every one should try to get as near to this as he can.

If one-third of the corn must be replanted to get a perfect stand it is best to cut up the field with the disk, or Acme harrow, and plant it all again, unless it is quite late in the season.

Do not put strawy stable or barnyard manure on light soils for corn. The manure will increase droughty conditions to such an extent that it will do more harm than good unless the season is unusually wet.

It is more economical to have a "turning-row" or headland nicely seeded to grass than two rows of corn crushed down by the team and cultivators in turning, or much time lost in the effort to turn without crushing the corn.

If your team crowds together in the cultivator, trampling the corn, tie the outside ring of each bit to the end of a stick four feet long, using a string of such length that the stick will hang just under the jaws. This will draw the horses apart.

If the ground and air are dry, compress the soil above the corn; but if the ground is wet and drying slowly do not compress it. If compression is unavoidable, as it is when the two-horse planter is used, loosen the ground with the smoothing harrow.

The man who plants his corn by hand will do well to soak it in warm water over night just before planting. This will bring it to the surface at least two days earlier; desirable as the season advances toward lateness, and equally desirable early in the season, as it reduces the amount of rotting.

The frequency of cultivation should not be measured by days, but by condition of soil and atmosphere. Cultivation should be often enough to keep weeds below the surface, to prevent the formation of a crust on the surface, and to keep broken near the surface the continuity of the crevices between the soil particles.

THE BLACK KNOT OF PLUM AND CHERRY TREES.

DR. B. D. HALSTED, NEW JERSEY EXPERIMENT STATION.

There is no question whatever about the black knot being caused by a low form of vegetable growth, called a fungus, that sends its minute threads through the substance of the twigs and branches. When the leaves are off the galls are most conspicuous and are frequently so numerous as to greatly disfigure the tree that is being killed by it, as shown in Fig. 2. This engraving is from a photograph of a young plum tree made worthless by the ravages of the fungus. The knots vary in size and shape, some extending entirely around the twig, while others grow lengthwise of the branch upon one side, and cause it to become bent almost double, in which case the portion above the excrescence dies. The surface of an old knot consists of a black and undulating crust that finally breaks up and exposes the worm-eaten interior. A knot three years old is shown in Fig. 1; it may spread up and down the stem from season to season. A young knot begins by a manifest swelling of the twig, soon followed by a cracking of the bark, and in the rifts multitudes of spores are produced. Such a young knot is shown in Fig. 3 exhibiting the characteristic swelling and cracks. The spores are minute spherical bodies which are readily carried by the wind, and falling upon the surface of young shoots germinate and send their filaments through the tender bark into the growing substance beneath, and begin a new knot. As the season advances the olive color of the surface of the young knot changes to the dark crust within which are minute cavities that bear a second kind of spore. These escape in spring and are then ready to spread the trouble to new parts. It is a fact that cannot be too emphatically stated here that the last named spores are matured during the winter months, and that they will continue to ripen when the knots have been removed from the tree and left undestroyed upon the ground.

A practical point in this connection is the range of species of plum and cherry trees upon which the black knot occurs. There is probably no variety of cultivated plum that is exempt from it, but on the other hand some kinds of garden cherries do not seem to be subject to the destructive influences of the knot. The Morello and Mazzard varieties are quite susceptible, and therefore in many parts of the country there is but little encouragement to grow them. The pest, however, is not confined to the cultivated plum and cherry trees, and this fact adds considerably to the burden of eradicating the knot and making systematic effort all the more imperative. The following are the wild species that suffer from the attacks of the black knot. The Chickasaw plum (*Prunus Chicasa*); the beach plum (*P. maritima*) a low thorny shrub of the seacoast; and the wild yellow plum (*P. Americana*). Of the cherries the chokecherry (*P. Virginiana*), the wild black cherry (*P. serotina*), and the wild red cherry (*P. Pennsylvanica*). There are, therefore, at least eight species of the genus Prunus that are more or less affected with the black knot, and one kind of prunus may take the disease from any of the other seven susceptible species. The general appearance of the knots varies somewhat among the various species of Prunus, which has led some to think that they were not all caused by the same fungus, but by direct inoculations it has been demonstrated that the spores from the knots of the chokecherry will produce the quite dissimilar excrescence common to the garden plum, a fact in this connection of no little importance.

The remedies at hand are few in number, and readily understood and applied by every one. The old one of removing all the knots with a knife and burning them is highly recommended. However, when a tree is badly attacked it is not easy to cut far enough below the excrescences to remove all the fungus. The writer has frequently seen vigorous trees, highly prized by the owner, so severely pruned as to leave only a few stubs and upon the tops of each of them would grow knots the next season. In all such cases there seems to be only one thing to be done and that is to remove the whole tree, and cast it, or at least the gall-bearing branches, into the consuming burn heap and the sooner the better. If there are only a few isolated excrescences here and there upon the tree the importance of removing these is not therefore lessened,

FIG. 1. MATURE FORM.

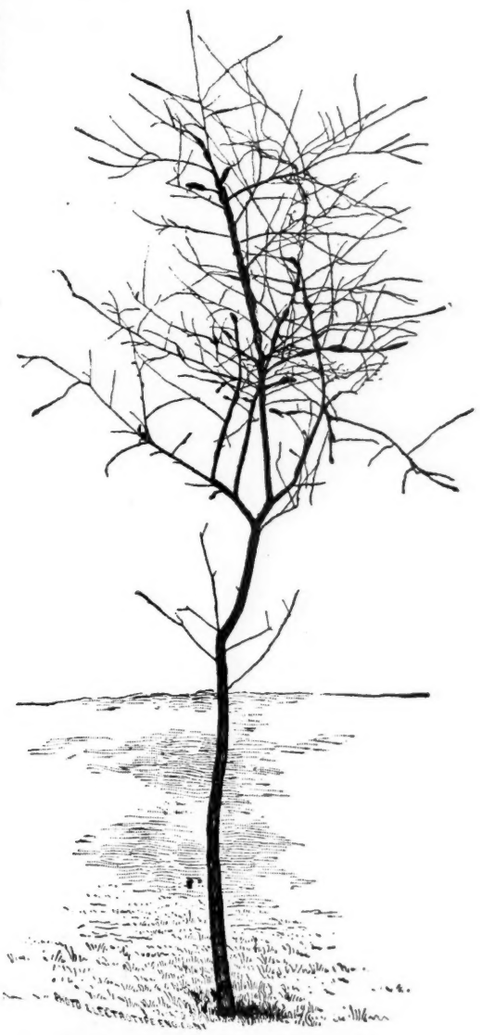


FIG. 2. BLACK KNOT ON PLUM TREE.

FIG. 3. YOUNG KNOT.

for they are the seats of a contagion that constantly gains ground through any delay. It is very important that the knots upon wild plants be destroyed. Therefore, seek out any knot-bearing tree in the highway or fence row, and cut and burn it. Last, but not least, pass through the wood lot with ax in hand, and destroy every specimen of chokecherry or other knot-bearing relative that may be found. The loss of the shrub will be as nothing when compared with the gain in choice fruit in the future. Take an active interest in this matter outside of your own domain, and if possible see that your neighbors upon all sides do as you have done.

Nurserymen above all others should be attentive to the instructions herein given. Whole rows of young trees may be diseased and when such stock goes out the evil accompanies it, and perhaps to localities previously exempt from the knot. While, therefore, watchful for the trouble upon the trees at home, see to it that the young trees coming from a distant nursery are free from the black knot fungus in any stage of its development.

SPRING FLOWERING BULBS.

Hyacinths.—These fragrant beauties of the spring garden are now in perfection of bloom, varying according to the treatment and care

FIG. 1. DOUBLE HYACINTH.

they have received. For one season's growth it matters but little what soil they are in, or its condition, providing they have been protected against freezing, which they must be to secure the best results; in fact, they will not endure hard freezing. The hyacinth loves a sandy soil made rich with well-rotted manure. If the garden is of a hard, tenacious character, a liberal mixture of fine sea sand will be very beneficial. The main feature of hyacinth culture is growing the bulb, which is not done to any extent in this country. In Holland, the home of the hyacinth, the bulbs are grown in light sand, and not allowed to perfect their bloom until they are large enough to sell. Annually the flower stems are cut as soon as they appear, which throws all the strength of the plant into the bulb for the next year's growth. What are usually termed first-class bulbs flower but once in perfection; then the bulbs divide into several small ones, each furnishing small spikes of inferior flowers. The best bulbs for the garden are those of second or even third size, as these will remain in the ground two or three years without breaking, and flower each year nearly as well as first-class bulbs, besides being much cheaper.

If the hyacinths were good, and are worth preserving, they should not be lost, and need not be. To preserve them the flower spikes should be cut as soon as the flowers fade, and after the leaves begin to turn yellow take them up and heel them in, in some out of the way place to ripen, which they will do in about two weeks, after which take them up and place them in a dry, cool cellar, where they can remain until the first of October, when they should be replanted. If the soil in which they were grown is light and can be easily worked without disturbing the bulbs, they can remain during the summer in the ground, which may be planted thickly with any desired annuals or bedding plants. Petunias make a showy bed, and also furnish shade for the bulbs, which is necessary for their preservation. The principal injury to them in summer, when left in the ground, comes from their getting too hot and dry; this will be avoided by a mulch of growing plants. As a rule, it is better to take the bulbs up and store them. But plantings should always be made in October, whether of bulbs previously grown, or newly imported stock. A well-grown spike of a double hyacinth is seen in Fig. 1. In Fig. 2 is depicted a specimen Roman hyacinth, especially valuable for early flowering and for forcing. Fig. 3 shows a single hyacinth growing in soil in a pot, and Fig. 4 flowering plants growing in water, in a triple hyacinth glass.

The Tulip.—For gorgeous display the tulip surpasses all other

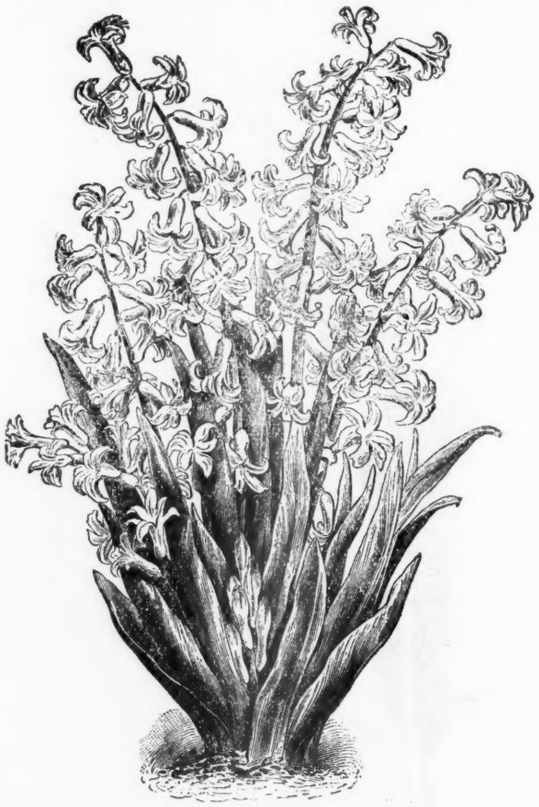


FIG. 2. ROMAN HYACINTH.

spring flowering bulbs, and is probably more extensively grown than all others. Its culture is of the simplest kind. Once planted, the tulip can remain undisturbed for a number of years, or the bulbs may be taken up annually after flowering, and laid upon a shelf to dry, and replanted in October or November, with a large annual increase. The cost of a good collection is trifling when compared with its real worth and the satisfaction derived from it. For the garden we prefer what is known as the late flowering or exhibition tulips, the only ones a real tulip fancier recognizes, and we should grow but few others, preferring to wait a few days longer in spring for the sake of flowers with true character. The early varieties make the most show and dazzle us with their brightness, but they are fickle. The late ones captivate us by their mere noble growth, strongly marked character and enduring beauty. The soil best suited to tulips is a strong loam, moderately enriched. They do not like a rank soil, or one freshly manured, or one nearly as rich as the hyacinth demands. In fact, planted in the ordinary vegetable garden, where they have full sunshine, they will find a home congenial to their tastes. Colors and markings to suit one's taste should be selected now, bearing in mind the fact that the higher priced varieties are not necessarily the best. Good mixtures of the late

sorts, listed as "rosy on white," in the seedsmen's catalogues, cannot fail to give satisfaction. A bunch of flowers of the most desirable varieties of tulips is presented in Fig. 5.

Narcissus.—This genus contains many forms, some difficult to manage, others of the easiest culture. The polyanthus section is not hardy and cannot be grown in the border unless protected against frost and standing water; in fact, beautiful as most of them are, they are not worth the trouble of growing. On the other hand, the daffodils and the poet's narcissus are as hardy as native plants, and when once established they will drive everything else out. There is one important feature in their cultivation, different from almost any other class of plants, viz: the longer they remain undisturbed the better they bloom. And they will bloom anywhere, under trees, in shade or sun, among shrubbery, or in the open border, only let them alone. They look well in long rows along a fence, but their most congenial home is in clumps, among herbaceous plants. The tops die down soon after flowering, and other forms will cover the places they occupy. The bulbs should be planted as early in October as possible, and if obtainable, it would be better to plant by the first of September, as they make a root growth early in autumn.

FIG. 3. POTTED HYACINTH.

FIG. 4. HYACINTHS GROWING IN WATER.

Lily of the Valley (*Convallaria Majalis*), Fig. 6.—Probably no spring flower is a more general favorite than this. The pure whiteness of its gracefully drooping tiny bells, with their pleasing fragrance, make it popular. The plant is robust, and, if planted in some out-of-the-way place, will shift for itself. Few plants, however, respond more readily to good treatment than this. To have it at its best, select a spot which is partially shaded in the hottest part of the day, and make it very rich by forking in a heavy dressing of old manure; that from an old hotbed is excellent. The plants to be set out are small tufts or pips, obtained by dividing old clumps.

FIG. 5. TYPES OF TULIPS.

FARMERS' GARDENS.

C. L. ALLEN, LONG ISLAND.

The farmer is the man of all others who should have not only a garden but the best one possible. He of all men cannot afford to be without a good garden; yet he is the only man that tills the soil and says he cannot afford to have one. His plea is that it interferes with his farming operations, which are of greater importance, when, as a matter of fact, it should be the most important part of his work, because it is not only the most essential to his happiness, but because it pays the largest dividends on the capital invested in healthful, nutritious, and delicious food. Every farmer, no matter what the size of his farm may be, should take an acre adjoining his dwelling, inclosing it with a fence, if fowls and live stock are allowed to roam over the farm. Such a fence may be made to answer the purpose of a grape trellis, and raspberries and blackberries can be trained against it, and kept in the best possible order. This plat should be in the form of a parallelogram, say 100x400 feet, with a border of three feet in width all around, in which to plant the grapevines and berries. This border, like all the rest of the garden, should be made rich and worked deep. The vines should be planted six or eight feet apart, and always kept well pruned and properly trained; and I need not say that the border should be kept perfectly clear of weeds, and the soil at all times worked the same as if planted with vegetables. In this border there should be nothing else grown, excepting perhaps early radishes and a row of lettuce, and it should be separated from the main garden by a path three feet in width, which should be covered with coal ashes to make it dry and hard, and to prevent the weeds from growing.

FIG. 6. LILY OF THE VALLEY.

The plat should be divided into two equal parts, with an avenue running through the center wide enough for a horse and cart to be driven through. This will form two plats 88x180 feet. One of these

should be devoted to asparagus, rhubarb, strawberries, and other small fruits. The other plat should be devoted to early and late vegetables. As soon as the soil is in a proper condition to work in spring, plant early peas, potatoes, onions, radishes, lettuce, beets, carrots, and parsnips; also set out early cabbage and cauliflower plants in sufficient quantities for family use. Later on, as soon as all danger from frost is past, beans—both pole and bush,— summer and winter squashes, melons in variety, a few hills of cucumbers, a succession of peas, and desirable vegetables may be planted. Where early peas are sown the ground may be cleared in time for a crop of celery; and where the early potatoes are grown a crop of turnips and cabbage for winter use can be obtained.

After the small fruits have come into bearing let us take an inventory of the garden and see what the acre up to this time has furnished for the table. Very early in the season we have all the rhubarb we require for sauce and pies, and for which purpose there is nothing more wholesome. Next in order is an abundance of asparagus, the most delicious vegetable the garden affords. Soon thereafter radishes and lettuce are ready for use. Before we tire of these the strawberry season commences, and what dish is equal to strawberry shortcake, smothered with rich, sweet cream? And now, in the height of the strawberry season, the acre is yielding all the peas, beets, onions, and potatoes that are required for the family. By the time the strawberries have ceased bearing the raspberries invite us to their portion of the acre; then come the blackberries, the two keeping up a succession for a month at least. In the meantime string beans, summer squashes, cucumbers, early cabbage, and cauliflower invite our attention, and while they are still luxuries the currants and gooseberries are in order; following in rapid succession is a bountiful supply of sweet corn, early tomatoes, melons in variety, egg-plant, and in fact all other vegetables that will relieve the monotony of the too common diet of the farmer—his favorite pork and potatoes. All these luxuries will be followed by delicious grapes for dessert; and, upon the approach of frost, the most delicate and tempting of all garden vegetables, the celery, will be ready for use; and of this there should be sufficient to last until spring.

Nor is this all; the acre will afford a surplus of all the small fruits which can be dried, canned or preserved for winter use. A keg of cucumber pickles can be put up, and all the tomatoes that will be required until the next season's crop is ready may be canned and preserved. The root cellar may be well filled with turnips, beets, parsnips, carrots and salsify, and a dry room, secure from frost, may be filled with squashes, which will keep until spring. From our acre we have at least two quarts of fruits and the smaller vegetables for every day in the year. It takes but a poor scholar to estimate the value of these productions to the family; it is at least ten times as much as the same acre would yield if planted to corn.

There is an additional profit to be derived from the garden that cannot be computed in dollars and cents. It is the moral and intellectual influence it exerts that is the most profitable. We do not want our boys to think there is nothing on the farm but pork, potatoes, cabbage, and hard work. On the contrary, we want them to feel and know that labor on the farm, rightfully employed, will furnish as many, or more luxuries, as can be found in other pursuits. A good garden is a good teacher and a profitable one. It contains many object lessons which tend not only to build up character but to increase a love for the farm and the home.

HOW TO BRUSH PEAS.

Market gardeners may not always find it practicable to brush peas, but, when they are cultivated on a not too extensive scale, brushing will repay the expenditure of considerable time and labor. The brush ought not to be set before the peas are up at least six inches, as it would interfere with the close working that should be given during the earlier stages of their growth. Set the brush upon that side of the row toward which the prevailing winds blow, and as the vines are blown toward it the twining tendrils will catch hold and begin to climb almost at once. Never thrust the brush down into the center of the row. True, this would make subsequent cultivation easier and would seem just the place to enable the vines to take hold readily. But if the peas are as thick as they ought to be, it will be difficult to place the brush in this manner without causing undue disturbance below the surface.

By care in selecting and placing the brush, a little may be made to go a long way. The butts may be put in some distance apart, and the tops crossed. The vine will seek its support as naturally as the root will seek its food. By planting in double rows, say eight inches apart, and putting one row of brush between, a saving may be made in both brush and labor, but this of course prohibits cultivating except on the outside of each row. An inexpensive device to take the place of brush is to drive stout stakes at some distance apart along the rows, and run several strands of twine from stake to stake. The first strand should be six inches from the ground, and six inches apart after that, running from two and a half to four feet in height, according to the growth of the peas.

POOR SEEDS

Seeds that are good may fail to grow, so that good seeds and those that produce good plants are not coextensive terms. Many good seeds fail to produce good plants because there are many causes for failure in the production of a plant outside of the seed. For this reason the tests known as germination trials made in test boxes are not more than suggestive guides as to the vitality of the seeds inspected.

One of the reasons for a failure of seeds to grow is that they were gathered before they were fully mature. If one looks at a handful of any seed, whether clover, bean, or squash, he will find that some seeds are either small, or light, or both, indicating that they did not mature. It is natural that a percentage of seeds should be immature, as the seed vessels do not have all their seeds of the same age, and at a time when the greater part are ripe some will still be green. Many seeds are abortive, or for some reason have failed to develop. They are not green, but consist mostly of the dry husk or shell. Such imperfect seeds are the most easily removed of all by means of the fanning mill, and there is but little excuse for such being in any abundance in the market seed.

A third reason for poor seed is age. Some kinds bear the passage of years before they begin to deteriorate much better than others. The "second summer" with some sorts is quite generally fatal, while with other kinds the second year must come before they will begin to unfold into seedlings. As a rule, old seeds are not popular, and there is good foundation for the general belief that the younger the seed is the better, after it has passed its first winter.

There are many other reasons why seeds are poor. Among the leading is poor parentage, and poor parentage may mean many things. A parent plant may be poor from coming from a poor seed or it may be due to too great moisture, or heat, or lack of food supply. Any one or more of the many untoward circumstances may give rise to imperfectly endowed seed, provided any seed is produced. Another series of poor seeds includes those that in themselves are good, that is, come from strong parents, grown under favorable circumstances, but are poor because they are lacking in those qualities that go to make up a profitable plant. It is a poor seed that will under the most favorable conditions only produce an inferior plant, whether in blossom, foliage, seed, or fruit. The seed is poor in possibilities.

PINEAPPLE CULTURE IN FLORIDA.

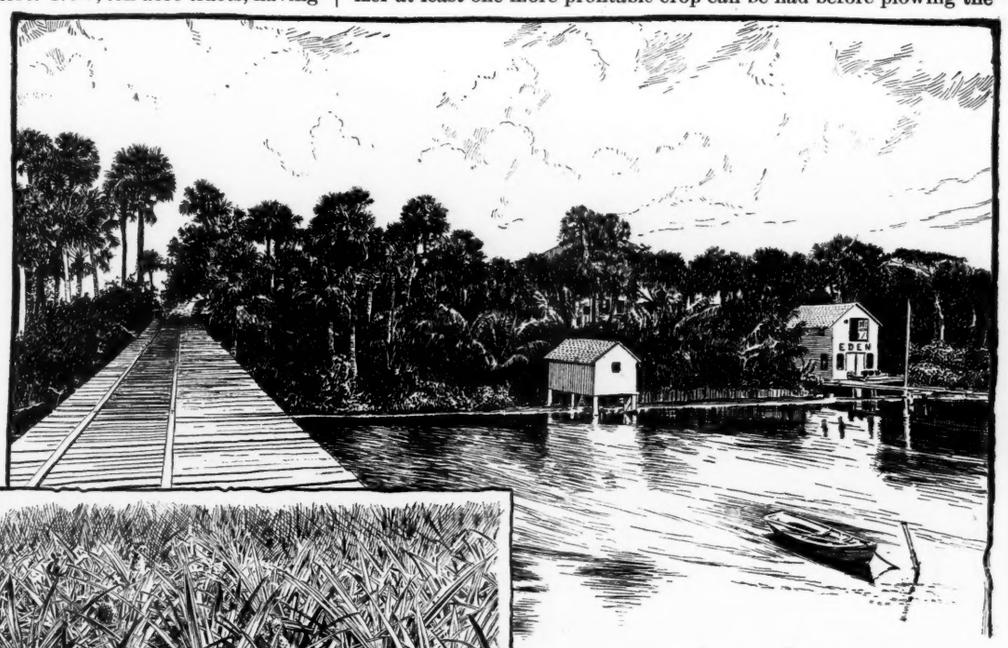
JAMES K. REEVE.

Pineapples are grown "in the open air" as far north as St. Augustine. But they require there considerable protection, which is afforded by latticed frames, covered generally by heavy palmetto leaves. Even so far south as Sanford the protection demanded is of such character as to leave the commercial success of the experiment yet an open question. In various other places they are grown in a small way, sometimes with and sometimes without protection, but not until reaching Eden, upon the Indian river, did I enter that which could claim the title of the pineapple region. Eden is very near the 27th parallel of latitude, about 2½° south of St. Augustine, and perhaps as truly "below the frost line" as any portion of the peninsula. During the ten years which have elapsed since experimentation was begun here there has never been any injury from frost, although once or twice there has been a slight trace of its appearance upon the foliage.

The largest plantation at Eden (or in Florida) is that of Thomas E. Richards, the pioneer in this industry. He began to plant in 1879, without experience or precedent to guide him, but with a firm conviction that the business could be made to pay. His first start was made upon the east side of the river, upon the narrow strip of shelly land lying between that and the ocean. A few months sufficed to show him that the soil was not at all adapted to this

specific work, and to prove that the pineapple would not grow upon shell land. Nearly bankrupt in purse, but in nowise discouraged, Mr. Richards removed directly across the river, and began anew. In the autumn of 1881 his first planting was made in the new location, and the best evidence of the success that he has found here lies in the fact that his plantation now embraces more than forty acres, and that its area will be doubled during the present year. In addition to this his sons now cultivate almost as much as he does himself, while in the immediate neighborhood perhaps two hundred and fifty acres of the plants are now growing.

It is not yet determined how much land in this vicinity is available for this purpose, but at the best the area is not great. And while it is by no means as yet all under cultivation, or even held by prospective pineapple planters, the rapid increase in value of everything adjacent to these plantations further attests the sound financial basis upon which the planters rest. A few years ago this land could be bought at five dollars per acre. Now, ten-acre tracts, having a river frontage, are selling at one hundred to one hundred and twenty-five dollars per acre. In establishing a plantation there must be added to this first cost of the land an average expense of sixty dollars per acre for clearing it. Then the cost of the plants—six dollars per thousand and from ten thousand to fifteen thousand being used per acre—completes the cost of establishing the plantation, except the expenditure for labor in planting and cultivating, and the cost of fertilizing until the plants come into bearing. Taken altogether, a capital of not less than three thousand dollars should be available for one undertaking to establish a ten-acre plantation. To undertake more than this would not be wise for a beginner, for however great the profits have been, or however well their continuance may seem assured, the beginner will doubtless find drawbacks which it will be best to meet and to overcome, at first on a moderate scale.



EDEN ON THE INDIAN RIVER.

A FLORIDA PINEAPPLE PLANTATION.

The pineapple is propagated in three ways, or rather from three sources—from the "crowns" which grow on the top of the fruit, from "suckers" which rise from the stem at the junction with the root, and from "slips" which start out beneath the base of the fruit at its junction with the stem. From a single plant an average of perhaps ten crowns, suckers and slips may be obtained each season, each of these being the basis for a new plant in turn. Thus, one may rapidly increase their stock of any desired variety, which is an added reason for not plunging in too deeply at first, or until knowing just what one desires to plant. A few years ago a pineapple was a pineapple—neither the less nor more—and anything was planted that could be obtained. Now plants are being brought from every quarter of the globe where the fruit is grown, and carefully tested for size, color, quality, productiveness, etc., and varieties once thought good are now being dug up and cast away.

Many matters, except the choice of variety, are yet experimental, as the distance apart at which to plant. This is to be determined partly by the habit of growth of a given variety, by methods of cultivation to be followed, etc. The best fertilizer is also yet to be decided upon; for while it has been demonstrated that they will fruit in this soil without such aid, a systematic course of fertilization must be kept up in order to produce best results. It is also an open question, as yet, how long a certain plantation may be profitably cropped; in pineapple culture it has been usually considered that three, or at the most four crops is as much as they should be permitted to produce, a further crop being profitless. I have, however, examined fields here from which the fifth crop was taken the past season, and the owner believes that by the liberal use of fertilizer at least one more profitable crop can be had before plowing the plants up. A great advantage that pineapple growing has over orange culture is that one does not have to wait long for returns. The plants being set out in the autumn, the first crop (and a full one) is taken off a year from the following June. Some fruits will appear before this, and afterward through every month in the year, but the bulk of the crop will be ready for market at that time. An acre, as ordinarily planted here, will contain fifteen thousand plants. From sixty per cent to ninety per cent of these will fruit, owing to conditions of soil, cultivation, fertilization, etc., that is, upon an average, an acre will yield ten thousand fruits. These will net the grower from three cents to twelve cents each, depending upon size, quality, season and condition of the market. Two acres of Egyptian queens, a luxuriant mass of thrifty growth, yielded the past year a net income of seven hundred dollars per acre; while the lowest return upon this place was from the old plat above referred to, and this gave, net, three hundred dollars per acre. That these figures are not excessive is borne out by the values at which these lands are held. I doubt if any acre of cultivated land well set to good varieties of fruit, and in a good state of productiveness could be purchased for a thousand dollars. Certain it is that good dividends could be obtained upon such a basis of capitalization.

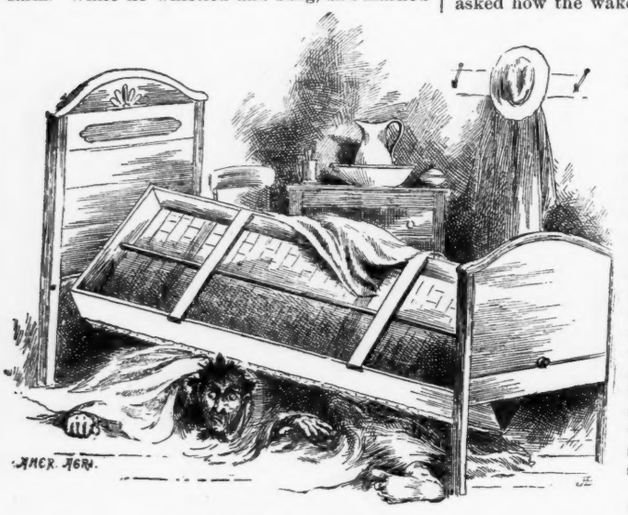
Brain Work.—It is profitable to work the brain as well as the hands. The man who studies into the best ways of doing things not only makes an easier but a better living than his plodding neighbor who does everything "by main strength." Other conditions being equal, the man who employs most brains will always come out ahead, be it on the farm, in professions, or in commerce.

HOUSEHOLD

Bob Bell and His Waker.

GEORGE A. STOCKMAN.

In a truck-garden town Bob Bell obtained a living, and something more, from a snug five-acre farm. While he whistled and sung, and marked time with the weeding-hoe, his mind returned again and again to the problem presented by the *Morning Waker*. Bob's hobby was early rising, or, more correctly, the means or machinery by which early rising could be accomplished. He studied long on the problem, and at last came to this conclusion: To cause a man to leave his bed it is necessary not only to wake him, but also to make further stay in bed impossible. At first one alarm clock will wake any man, but after awhile a hundred clocks will have no effect. If they waken the sleeper, he hesitates and exclaims, "Yes, yes, I'll be up in a minute," and goes to sleep again.



"THE WAKER DID ITS DUTY."

"The only way," said Bob, "to get a man up is to upset the bed, and upset it in such a way that it will shake up the sleeper, arouse him completely, throw or turn him out of bed. Then, being out and up, he will not return." Bob was a heavy sleeper, and had invented various appliances for making a disturbance in the early morning hours when he wished to start for market. But all had failed. His aunt who kept house for him was the only waker to be relied upon.

At last a plan of a waker suggested itself to Bob's ever-probing mind, and Bob began forthwith to construct it. The bedstead had a high headboard, on which was attached the cords and weights demanded by the invention. The frame on which the bed rested hung upon a central pivot or rod extending lengthwise, firmly set in the center of the headboard and footboard respectively. When the supports at the corners of the frame were removed of course the bed would revolve one way or the other, according to the preponderance of weight on this central axis. The clockwork attached to the headboard provided for the withdrawal of the corner supports at any time desired. When the weight touched the floor the supports fell away, and the bed, of course, would revolve, for it was not likely that the sleeper would lie exactly in the middle.

Bob had great hope of this invention, and soon tested its merits. He wound up the weights and went to bed with the thought that he would be rolled gently out of bed in the morning at four o'clock exactly, and be up and doing as he wished. The waker did its duty and woke up Bob at the appointed time, but not so gently as he had planned. Like some other inventors, Bob had labored for a certain result, and that reached in the planning had not looked beyond. It did not occur to Bob that the bed, once set in motion, would continue to revolve while the impulse lasted; that, as soon as the side of the bed on which he was sleeping fell away there was nothing to prevent the other side from following.

This was demonstrated to Bob's satisfaction; no, not to his satisfaction, but rather to his full understanding. The bed turned under his weight with speed, dropped him on the floor, and the other side turned over and struck him a terrible blow—a blow that cut a gash over one eye, knocked in a tooth, and otherwise bruised him. That was a stunning surprise in more than one sense. Still, the waker was a success, for Bob was awake, and had no thought of returning to bed. Dejected, sore, Bob limped down to breakafast. When his aunt asked how the waker worked, Bob groaned and called for plaster, and she, unable to contain herself, went into another part of the house and laughed.

No more was heard of the waker for several weeks, but after the wounds had healed and usual cheerfulness returned, Bob turned to the waker again. "It's a good thing," he exclaimed again and again; "it not only wakes a man up, but also thumps him to make sure. But it is enough to fall two feet without the thump. It is only necessary to stop the revolving motion before the bed strikes. Easy enough. Rubber bands will do it, giving the bed a chance to turn half way 'round, deposit the sleeper on the floor, and stop. I'll try it."

He wound up the weights to run down at six o'clock in the morning. As he was on the point of attaching the rubber bands, his aunt called him and announced that a neighbor wanted a watcher. Ready to respond to any call, Bob hastened down. He glanced at the bed. It was set to go off at six o'clock. "I won't stop to put on the rubber bands," thought Bob. "It can't hurt anybody."

Soon after Bob went away Bob's Uncle Silas appeared. He was an eccentric, testy old man, with a "big pile of rocks," as he called his money. Bob and his aunt hoped to be remembered in his will, and when he came they showed him much attention. Uncle Silas had a horror of unaired beds, and, as Bob was out for the night, Uncle Silas was conducted to his room. As nothing had been said for a long time about the waker, Bob's aunt supposed that it had been abandoned,

A few minutes before six o'clock the next morning Bob returned from his night's vigils, and as he sat down to the breakfast table his aunt remarked, "Uncle Silas came last night, and I put him in your room." With a whoop Bob sprang up and rushed toward the stairway, but he was too late. There was the sound of a body falling on the floor above, a wild shriek, and then silence. They stood still, wringing their hands, undecided as to what to do. There! He is moving—probably dressing. Heaven be praised, he is alive!

At length Uncle Silas appeared with a handkerchief around his head, one arm in a sling, and a limp that made him wince at every step. In vain they explained and implored. He waved them off, and walked out of the house, turning at the door to say, "Not a dollar, either of you!" They never saw him again. "You see," said Bob, moralizing, "what comes of fooling with ideas!"

"NOT A DOLLAR, EITHER OF YOU!"

Toys for Babies.

ANNIE H. DONNELL.

Bright pieces of plush cut in orange peel shape and cross-stitched upon the edges will prove a most entertaining present to his or her small Majesty, when made into a ball plump but not hard with cotton or soft bits of cloth. A bow of ribbon on the top is an addition, but should be of a color that will not come out when the bow is inserted in a wee little mouth, as it is sure to be. Otherwise, it is better to leave this bit of decoration off entirely. Don't corrupt the little man's or woman's taste by using inharmonious bits of plush!

The common rubber ring of the toy shop has three knit balls attached to it by double cords of the different colors of worsted twisted together. The balls are made with the ordinary knitting stitch, widening continually to the center and then as gradually narrowing. In the center of each is inserted a tiny round pill box with—yes, pills in it, if you choose, or anything that will rattle. The cover should be carefully glued on so that it cannot work off when inserted in the ball

and then carefully wrapped with bits of cloth or cotton, bound about and sewed through and through with thread to keep the box always in the center. A small bow of a fast color sewed tightly on completes an article that will be highly appreciated.

How to Make a Hammock.

EVA M. NILES.

Light, pretty hammocks or tennis nets, can be made at home, with but slight expense. The directions given will make a hammock, small in bulk

IN THE HAMMOCK.

and light in weight, although it is of the dimensions required for use by persons of all sizes and weights. The cord employed in making is of the soft cotton variety, this being the best for hammocks that are to be carried about from place to place, as it is very light and also very strong. Persons who seek rest and enjoyment at rural and seaside resorts usually carry their own hammocks with them, and find them articles of comfort when tired. Nature asserts itself and demands attention.

The tools for making a hammock are—first, a "seine needle," which may be obtained at any fishing tackle store, and a mesh board or wedge. The wedge or mesh stick is used in forming the meshes. The wedge may be purchased in any hardware store, or in any place where fishermen's nets, etc., can be bought. It can, however, be made at home by a handy father or brother. Take a smooth piece of hard wood eight or ten inches in length, an inch and a half in width, and about three-quarters of an inch in thickness; and have it beveled or planed off toward one long edge, so that this edge will be about an eighth of an inch in thickness, leaving the heavier edge of the wedge from three-eighths to half an inch in thickness. All sharp angles should be smoothly rounded off, and then you have your wedge or mesh stick.

The needle or shuttle required in weaving the hammock is similar to that used by fishermen in

NEEDLE OR SHUTTLE.

making nets, and may be purchased wherever the wedge can be procured, or like the wedge it may be made at home. Take a smooth piece of hard wood about ten or eleven inches long, a little less than an inch wide, and only thick enough to be supple, but not to break. At one end cut it out so

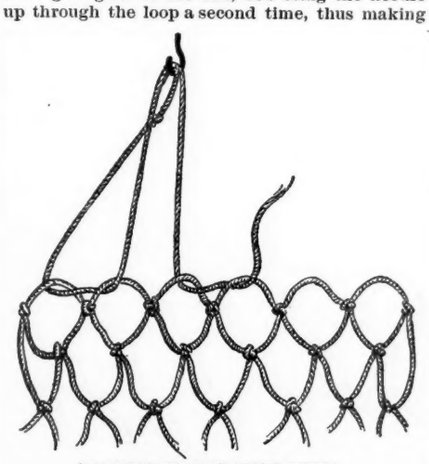
WEDGE OR MESH STICK.

as to form a deep curve or heel to catch the cord, and shape the other end off to a long point, thus producing a tongue or olive point. About an inch and a quarter below the point cut away the wood about an eighth of an inch from each side of the center for three or four inches down, to form a prong or tooth, about which the cord is to be wound. To wind the shuttle, hold the shuttle in the left hand and wind the cord over and under, twisting it once about the prong at each turn. The shuttle should be held loosely and in the one posi-

SHUTTLE FILLED.

tion while winding, so as not to twist the cord, which should be wound on evenly and compactly so that it will not slip off during the process of weaving.

Now proceed as follows: Take a piece of cord a foot or so long and tie the ends together, making a loop on which to knit the first row of meshes, and hang it on a hook or nail. Tie the loose end of the cord on the needle to the loop mentioned above, and place the mesh board underneath close to the loop; then carry the needle down under the board and up through the loop, drawing the cord tight; place the thumb (the mesh board being held in the left hand) so as to hold the cord in position on the edge of the mesh board, and throw the bight (or slack) of the twine loosely toward the left and carry the needle under the right side of the loop and up on the left side through the bight and pull it down snugly. The same operation should be repeated, with the exception of putting the needle between the loop and the bight, so it must be carried through the loop and the bight at the same time. In order to make the knot more secure, it would be well to throw the bight again to the left, and bring the needle up through the loop a second time, thus making



WORKING IN THE EDGE CORDS.

the knot double. This suggestion applies to the first row of meshes only. Continue this until you have a sufficient number of meshes for the width of the hammock, thirty being the usual number; then slip the meshes off the mesh board and allow them to hang from the cord on the needle; then place the mesh board underneath, in the same manner as at first, and repeat the original operation, putting the needle through the first mesh instead of the loop, as in the first instance, and making the knot as before. Follow the meshes along in the same way, until the hammock is the desired length. It is usual to make it about six feet long when stretched for a full-sized hammock, and then to put on each end strings about two feet long, reaching from each end mesh to an iron ring about an inch and a half in diameter, to which the ropes for swinging it are attached. When metal rings are used, hang the ring, to be fastened on, upon the hook and run the guys through instead of on the hook, and wind the cord about the guys

FINISHING UP THE END.

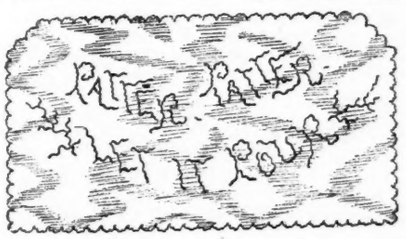
for several inches. The cord may be bought by the hank or pound at small expense.

The same tools and the same variety of stitch are essential in making a tennis net, and such work can be taught to young men with strong hands, who can make very durable nets for this game.

A Pretty and Serviceable Splasher.

FRANCES H. PERRY.

A description of this pretty splasher seems almost superfluous, it is so plainly delineated, but a few words may be helpful. The marbled rubber-cloth, of which it is made, is cut to fit the space to be protected by it and is then pinked all around



A MARBLED RUBBER SPLASHER.

the edge. If a pinking iron cannot be had, cut the edge in tiny irregular points and notches in imitation of ragged edged paper, but never in deep points or scallops, for they will roll up. The words "Patter, patter, let it pour," a quotation from the good old April shower song of childhood's days are painted in rustic letters with oil paint—vermilion or Indian red—using a medium sized sable brush. Any other suitable quotation might be employed instead. Such splashers are most durable and easily cared for, requiring nothing but an occasional wiping with a soft cloth to keep them as fresh as when new.

Potato Cozy.

F. P. SCRIBBLER.

Do all of the AMERICAN AGRICULTURIST housekeepers know how nice baked potatoes are if they are each given a little pinch—just enough to crack the skin—when taken from the oven and speedily rolled up in a thick cloth and left in a hot place for a few moments before serving? Those who have not tried it can hardly imagine what an improvement it is over the common method of carrying them unprotected directly to the table. The escaping but partially confined steam leaves the potatoes dry and flaky, and at the same time moistens the skins and loosens them from the appetizing browned coating just beneath—which must otherwise be removed with the skin. If nothing better is at hand a folded towel will do to wrap them in, but they are hardly ornamental served in that way, and they rapidly grow cold if removed from the cover.

Double napkins of heavy linen, momie cloth or fine toweling, made expressly to supply the need of a neat cover for the purpose, have long been in use, but a pair of napkins or cozies made recently

A POTATO PROTECTOR.

were so novel, pretty and inexpensive that a sketch of one of them is herewith given as a suggestion to rural housekeepers. From a good linen salt bag two squares about the size of a large napkin were cut, both were fringed on all sides, and one was further ornamented with a border of drawn work and the words, "Hot Murpheys" in

outline stitch near the center, as shown, both worked with red wash linen floss. Then the two were stitched together just inside the fringed edges—which were afterward lightly overcast together to prevent raveling. The result was a heavily fringed double napkin large and thick enough to absorb the steam and hold the heat, and also pretty enough to grace a neat dining table. The mate to it was decorated with potato blossoms, scattered irregularly over it inside the drawn work border.

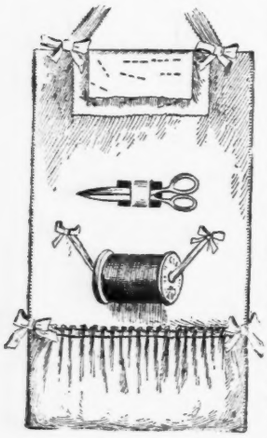
A towel shaped cloth, plainly hemmed, made from the same material—of which there is usually plenty in every farm house—makes a nice oven-cloth with which to take out, brush off and pinch the "hot murpheys" before wrapping them up.

Many other useful, and often pretty, articles may be fashioned from the same linen by the exercise of a little skill and patience, the cloth being really better than many pieces of butcher's linen which are purchased expressly for the same line of work.

A Boot Button Case.

ANNIE HAMILTON.

In making this, cut a piece of cardboard to the size of a postal card, or a trifle larger, if preferred, and cover it smoothly with such material as is desired. A small pocket is "fulled" upon the lower portion, while two leaves of unequal size are attached to the top. The pocket is a repository for shoe buttons that fly off at tangents and are picked up from every floor in the house. The leaves above are for needles, and the spool for thread, by which they can be restored to their original positions, when the small pair of scissors will come into play in cutting the thread that has followed the needle in and out of the leather. The spool of thread is suspended upon a narrow ribbon, while bows of the same are placed in the positions indicated.



A HANDY BUTTON CASE.

A Chimney Corner.

WEBB DONNELL.

The old-fashioned homes that experienced sunshine, snow, and rain before the eyes of many of the present generation were opened upon the world at all often seem very bare and cold in their interior furnishing to these same eyes, accustomed as they are to more of the refining influences of the present day than fell to the lot of our good ancestors. Young people sometimes feel the cheerlessness of these old houses (and of some of the new homes that show a lack of "*hominess*" in their construction), and chafe at their surroundings, when they ought to know that these old houses can be made into most charming and homelike shape if only ingenuity and taste are made to do their part. There are nooks and corners in almost every old room that are full of beautiful possibilities. One of these is a chimney corner that is so often to be seen—a little square recess between the chimney and the side of the room—a corner that is almost never utilized in many houses unless it is to accommodate a lonely-looking chair.

I have made two drawings, somewhat on the plan of the medical almanacs that represent a patient "before taking," Fig. 1, and "after taking," Fig. 2, although I trust that a suspicion of exaggeration may not be attached to those accompanying this. Arranging this corner as suggested is as much in the line of utility as beauty, for it affords a convenient writing desk, if one wishes it, as well as shelves for books. The construction ought to be easy for any one who is ingenious and "handy" with tools, be he young man or the father of the young man. The sides of the recess are smoothly boarded, to furnish a chance to support the shelves, since the wall — on the side of the chimney, at least—will be of plaster. Four full shelves, and a narrower one for the top, will be required. Between the third and fourth shelf, counting from the bottom, is neatly inserted a door, hinged to the shelf below, which forms a

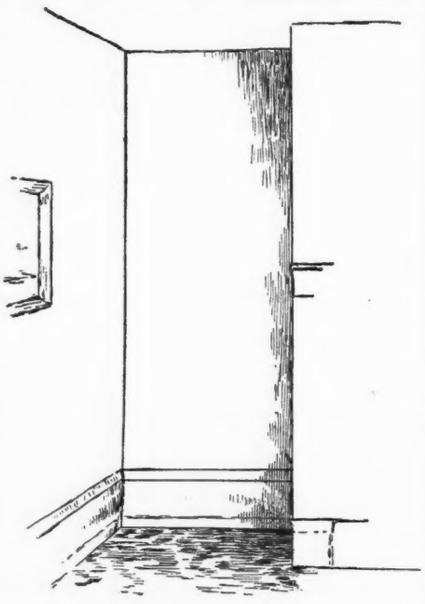


FIG. 1. BEFORE REMODELING.

writing-desk when let down to a horizontal position. It is held in this position, when open, by small brass chains, securely attached to the door and to the woodwork on either side. This space can be utilized in other ways if desired. A bric-a-brac closet can be made of it, inclosed by two glass doors, opening in the middle and hinged at the sides, in which case the panes may be of rough opaque glass of odd shapes, or of clear glass, to show the interior. The space can also be used for books, in which case the curtain must be long enough to cover all the shelves occupied in this way. This curtain is very handsome, and hangs

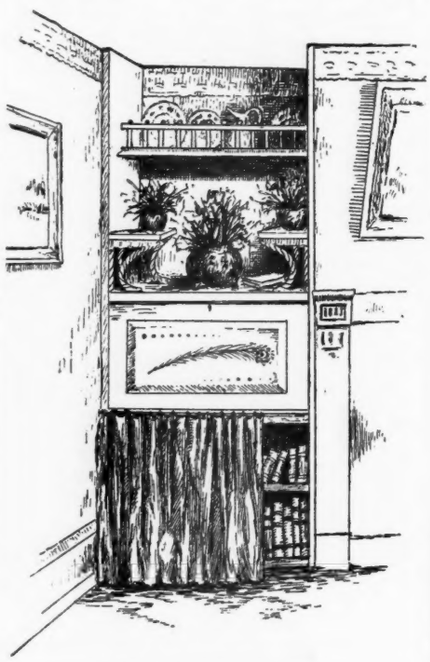


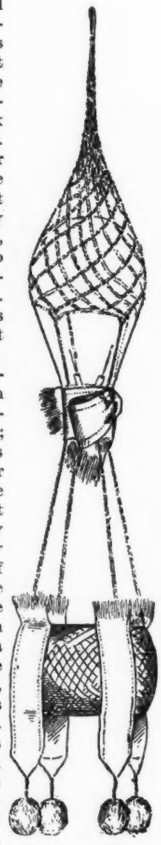
FIG. 2. AFTER REMODELING.

in graceful folds, when made of velours, which is somewhat expensive, but cheaper goods will answer very well, provided a color is selected that is in good taste. The space above, arranged as I have shown, is well adapted for bric-a-brac and for colored jars of ferns in their season, or for jars filled with dried branches of shrubs from the roadside, with their russet leaves and bright red berries, that will give a dash of color to the room. The old, old bits of china that greatgrandmother used to have upon her table can find a fitting resting-place upon the narrower upper shelf. It is perhaps unnecessary to say that the plans given here need not be followed to the letter, but they can be used as suggestions for the display of one's own ingenuity, and it is hoped that they may also suggest the idea that other bare nooks and corners about the house may also be made both useful and attractive.

A Balloon Match-Receiver.

SUSIE C. STANDISH.

An incandescent globe, a small round basket, one yard of ribbon one and one-fourth inches wide, four silk balls and crochet silk are required to make the balloon shown by the illustration. The ribbon, balls and silk may be of any desired color. Four pieces of ribbon four inches in length, fringed at the top and finished with balls at the bottom are fastened lightly on the basket. To make the net, crochet a chain long enough to go around the globe a little below the largest part, and join. Make a chain of seven stitches and fasten with a single crochet in the fifth stitch of the chain continue in like manner to within three stitches of the end; then chain seven and fasten in center of chain seven of last row; make two more rows like this one; then have six chain for two rows, gradually lessen the length of chains and fit the net to the globe; finish the top by making two loops of forty stitches each. Four chains of eighty stitches each form the cords that attach the net to the basket. The cords are drawn together and fastened with a bow in the center. Balls can be used instead of a bow, if desired, in which case, only five-eighths of a yard of ribbon is needed. Tinsel can be used for the cords and mixed through the net and made into small loops in place of the balls. This makes a very pretty ornament for the chandelier. It is a much better way to put a tiny glass tumbler or tin box into the basket to hold the burnt matches. It keeps the basket cleaner, and there is no danger then of fire. The materials for the work can be obtained at any large dry and fancy goods store.



A PRETTY ORNAMENT.

A Homemade Carpet Stretcher.

ALICE E. PINNEY.

Take a square block about one and one-half feet long and tack cards, such as they use at the factories, to the lower side. Then insert a handle. It is well to have a long handle, so that the person

DEVICE FOR STRETCHING CARPETS.

stretching the carpet can stand some distance away. The wires in the carding will catch into the threads of the carpet in such a way as to hold it very securely without tearing it, even if it be somewhat worn and tender. It is a great improvement on the boughten stretchers which sometimes tear a comparatively new carpet. The strips of carding can be bought at a factory.

A Pretty Wedding Gift.

LYDIA HOLLY.

I managed one day to visit a lady's studio, and was quite interested in being shown the different work the pupils were engaged in. I was greatly

pleased with a bed set being painted by a young girl for a school chum, soon to be married. The foundation of the spread and shams was the best quality of cheese cloth, in its beautiful natural color—cream. In the center was painted a large design, quite elaborate, and which formed a wreath. The design was in morning glories and their leaves, all the different colors of the flower being daintily and harmoniously arranged. In the center of the wreath was a pretty monogram, the letters of which were entwined with miniature morning glories. The pillow-shams matched in every particular. Orange silesia lined the set and heavy lace edged the same. It was simple and pretty, and is not a difficult or expensive undertaking.

Beds and Bedding.

M. W. EARLY.

It is so desirable to keep our feather beds and mattresses clean that I would advise every housekeeper to keep a case of cheap gingham or domestic cloth over them. This case can be taken off and washed whenever it is soiled, and thus you will be enabled to have your beds and mattresses always presenting a clean exterior. I have known the ticking of a feather bed to become so soiled from years of usage that the housekeeper has had to pour out the feathers and then replace them, after having the bed tick washed, involving a series of troublesome and disagreeable jobs—for loose feathers are exceedingly unpleasant to deal with. They are fluffy and volatile, and stick to your clothes, and pervade the atmosphere in a troublesome way. Protect your pillows and bolsters also with a case of some colored cotton goods, over the bed-ticking. If you have a faded gingham or percale dress, you can scarcely utilize it better than in making cases for your bolsters and pillows. Of course I do not mean that these gingham cases shall take the place of the outer white cotton ones, but merely that they shall protect the ticking of which bolsters and pillows are made. Sometimes one of your little girls will have two gingham or two percale or calico dresses alike, and when these are outgrown and faded they will afford match cases for a pair of pillows.

A nice housekeeper of my acquaintance has her mattresses made in sections, so the parts may be turned in different directions to prevent the chief strain from falling on any one part of the mattress. For instance, she will have a mattress for a large bed made in two divisions, as if for two single beds, and by turning these over each morning the same parts of the mattress are not in the center two consecutive nights, and it is here that the chief strain falls. I have even seen a mattress made in four sections, but I think this is pushing it too far.

It is conducive to health to have your bed and bedding well aired and occasionally sunned. You are fortunate if you have an upstairs back porch in which you can have your bed things well sunned. Some housekeepers consider it a piece of neatness and good management to have their beds made up as soon as they are vacated in the morning. But this is a great mistake. The bedding should be taken off and hung on chairs before an open window, and the air should freely play over the mattress or feather bed for at least a half hour before the bed is made up. Exhalations from the body are passing off all night, so the bed clothes are reeking with them by morning, and even where the person is healthy these exhalations ought to be dispersed from the bed clothes before these are replaced on the bed. You should have a separate set of pillow cases, or at least of pillow shams for the day time, as those which are slept on become unavoidably tumbled and soiled. A white bed coverlet is not only the prettiest, but in the long run the cheapest, as the colored prints which come for the purpose become faded by use, and still more by washing. A white spread of good quality will last a housekeeper many years.

Some housekeepers ruffle their cotton pillow cases with cambric ruffles, but it seems to me a far more sensible plan to put cotton ruffles which are much stronger than those made of cambric, and look just as well when nicely laundried. The cambric ruffles last about half as long as the cotton pillow, which consequently requires two sets of them. You can get "everlasting trimming" so cheap and pretty now that it seems hardly worth while for women to bestow their time and eyesight on elaborate knitted or crocheted trimming for their pillow cases, except where they have a superabundance of leisure and find it an agreeable pastime to make these trimmings.

Cotton Gowns and Straw Hats.

Beautiful as silk, are some of the cotton fabrics which adorn the shelves and counters of our city bazaars; especially those novelties which closely copy the rich Louis Quinze brocades, and display gay, chiné stripes of flowers and vines on a white ground, alternating with stripes of one solid color. Rather costly, however, are these and many will doubtless prefer the lower priced but really lovely ginghams, which are so fresh and dainty in lavender and white, old rose and white, gray and white, and the porcelain blues. Those with a lace stripe are particularly attractive. For useful morning gowns, too, there are strong ginghams that sell for a few cents, and are neat and pretty with narrow white or bright-hued stripes on a dark background.

Sateens have less luster than formerly, and the favorite designs are graceful bowknots, lacy figures, or tiny posies strewn on a colored ground. Percales, too, are revived once more, especially for children's frocks and shirt waists; while the sheer batistes with lace bands will make delightfully cool afternoon gowns for warm weather. These last come in most charming shades of violet, green, ecru, pink, and blue, powdered with artistic floral designs while,—being thirty-two inches in width,—they are by no means expensive. Among wash dresses, too, must be included the tennis-suitings, flannelettes, and outing-cloths, which have so sprung into favor, and which now copy the French flannels to perfection. There has been a great advance in the style and manufacture of these since last year and even the cheap ones are of good designs and launder well, while the more expensive "suitings," that have a mixture of silk come in exquisite neutral tints and will make the prettiest of suits for traveling and country wear.

Careful women who can wear a cotton dress a whole season and then have it cleansed by a professional scourer have their fine prints made up exactly like wool frocks, with foundation skirts, and lined and boned Louis coats that extend ten inches below the waist-line in the back and front and shorter on the sides, while they are trimmed with pocket-flaps, vest, and deep, gauntlet cuffs of moiré silk. Or, perhaps, they are garnished with velvet, the effective Irish point lace and jabots of chiffon muslin. Simple gowns, however, that are intended to launder and thus renew their freshness are best with unlined belted basques, a wide plaiting being set on below the waist-line to give the regulation length.

As infinite and various as the summer gowns, are the hats intended to accompany them. Fancy lace-like braids are, perhaps, the newest style, but there are, also, plenty of chips and Neapolitans, as well as yellow Tuscans, and the serviceable Milan and English split straws; while those inclined to large, small, or medium-sized *chapeaux* can all be suited. A popular little hat for general wear is of black, open straw, its narrow brim pointed in front and spreading slightly on the sides. A twist of soft silk or crape with a knot in front and loops behind is the proper trimming for this, with a bunch of violets or buttercups set coquettishly amid the bows at the back. The three-cornered or "Continental" hat is striking and generally becoming, while it requires very little garniture, a pompon of feathers and a few loops of galloon being quite sufficient. Young girls look pretty as pinks in the Dolly Varden hat with a spray of fine flowers set on a velvet bandeau, beneath the low curving brim, and resting on the hair. The back is turned up and tied with streamers of velvet ribbon, while a wreath of blossoms runs from it across the crown. Feathers and flowers are again used in combination on the large, dressy, "Gainsborough" and "Cavalier" hats, of yellow, open straw; and extremely picturesque they are with royal orchids, or rich, blushing roses nestling on the right side, amid the long plumes which cover the crown.

Bonnets are small and lower than ever; the very lowest being the "saucer-bonnet," which is as flat as a tea-plate, and should only be worn with high hair. The average woman, however, will select the always popular capote, or the *chic* little bonnet which has a curved front, resting on a twist of velvet or crape. And here let us say, that crape in all colors is much used in millinery this season, being arranged in graceful loops at the back of bonnets, together with plaited fans of lace appearing to hold in place the floral sprays which always fall forward toward the front. The strings are of inch-wide velvet ribbon, that fasten in a short bow beneath the chin.

Strawberries for Present and Future Use.

To many the cooking of strawberries seems like painting the lily or gilding refined gold, and where one can only have a limited supply of this delicious fruit he may well hesitate about serving them in any other way than simply with cream and sugar. Many of the readers of the AMERICAN AGRICULTURIST, however, who can have berries galore for the picking, will be glad to learn of some tempting dishes of which they form the principal ingredient.

Strawberry Pudding.—Cut half a pound of stale sponge cake into slices and dip for a moment in milk. Arrange these in layers in a dish, with strawberries plentifully sugared, letting the top layer be of cake. When the dish is half full pour over all a custard made from a quart of milk, two beaten eggs, and two tablespoonfuls of sugar. Bake half an hour and eat cold.

Strawberry Dumplings.—Make a paste from one pint of sifted flour, two tablespoonfuls of butter (half lard if you prefer), a teaspoonful of salt, and enough milk to moisten sufficiently to roll out—about half a teacupful. Mix very lightly with the tips of the fingers, and roll out about a quarter of an inch in thickness; cut in rounds with a cake cutter; put from three to six berries, according to their size, in the center of each, and pinch shut. Steam twenty minutes. A nice sauce is made by beating to a cream a cup of powdered sugar with two tablespoonfuls of butter and adding, a couple at a time, enough berries to give it a pink appearance. Mash and beat while adding them until light, then place them in a cold place until wanted.

Strawberry Tarts.—The very attractive fruit tarts which one sees in the confectioners' windows may be very easily made at home. Supposing that you have mastered the art of making a good, light paste, roll it out very thin and cut three rounds for each tart; from the two upper rounds cut out the centers with a smaller cake cutter; place two of the rings thus made on a solid round of paste, and stand by the ice until very cold. Bake in a rather quick oven, take them out, brush over with beaten white of egg, dust with granulated sugar, and return to the oven long enough to glaze. Fill with fresh berries, and put a spoonful of whipped cream on top, or simply dust with powdered sugar.

Strawberry Cream.—Sprinkle a cup of sugar over a pint of fresh, hulled strawberries, and mash them with a wooden spoon. Extract the juice by rubbing them through a hair sieve, and add a pint of rich whipped cream, and an ounce and a half of gelatine dissolved in a pint of fresh milk. Wet a mold with cold water, pour in the mixture, and set on the ice until firm, when it is ready to serve. In order to dissolve the gelatine, soak it for an hour in the pint of milk, and then place the vessel containing it inside another of boiling water, and stir until dissolved.

Strawberry Ice.—Mash two quarts of berries with two pounds of sugar; let them stand for an hour, strain off the juice, add the juice of one lemon and one orange, and a pint of water, and freeze.

Strawberry Sherbet.—Boil three cups of water with two of sugar and the juice of a lemon for half an hour; pour it over a quart of strawberry juice, and freeze.

Canning.—Canned strawberries, to keep their flavor and color, must be put up while perfectly fresh. If possible, they should go directly from the field to the kettle. Do not wash them; if any are soiled reject them. Put them in a granite preserving kettle in alternate layers, after weighing both fruit and sugar. Use half a pound of sugar to a pound of the fruit; let them stand an hour and then set over the fire. Heat slowly, and as soon as heated through fill the jars; seal, and when cool set away in a dark closet.

Preserves.—To seven pounds of fruit allow five and a half pounds of sugar and three cups of water; boil the water and sugar for fifteen minutes, skimming the while; add the fruit, and cook slowly forty minutes.

Rhoda's Memorial Day Apple Blossoms.

AGNES CARR SAGE.

Rhoda was swinging on the garden-gate. It was her favorite amusement, the steed she always mounted when she wished to dash off into that most delightful of all lands for young folks—the Land of Make-Believe. The May sunshine filtered through the blossom-decked boughs of the old apple tree that stood sentinel at the wooden portal and, occasionally, a shower of fragrant petals came fluttering down to rest on the little maiden's flaxen hair, or nestle in the folds of her brown print frock, like flakes of rose-tinted snow.

Rhoda swung and swung, her small, blue-veined hands tightly grasping the pointed, whitewashed pickets, her feet wedged in between the palings and her body stretched forward that she might gaze up and down the village street. To-day, however, she was not fancying herself a fine lady, in green velvet, galloping over hill and dale on a snowy charger, but was eagerly watching, with curious eyes, the men, women, and children who hurried past, nearly all of whom carried blooming plants or bouquets of flowers in their hands.

"I wonder where they can all be going?" thought Rhoda, and presently, as two young girls and a boy appeared, each staggering beneath the weight of a gay geranium, she ventured to ask them the question.

"To the cemetery, of course," replied the older lassie somewhat scornfully. "Don't you know it is Memorial Day?"

"Memorial Day!" repeated Rhoda looking puzzled, for having spent most of her short life in an isolated country almshouse, she had never even heard of the springtime National holiday.

"Yes, silly," put in the lad. "The day when all the soldiers' graves and pretty much all others besides are decorated with flowers! I thought everybody knew that. My grandfather was a Colonel in the last war and he is buried up yonder along with many another brave comrade."

"So is my soldier uncle and Josie's mother's cousin," piped the smallest of the trio, swelling with ancestral pride. "But come along Rafe or we shall be late," and the three moved on just as martial music sounded on the air and up the street came a brass band playing an inspiriting march, and followed by a large wagon decorated with flags and laden with magnificent floral pieces, while in its wake trooped hundreds of school children bearing their tribute of spring beauties for the gallant dead or the friends who have "gone before." For the little town of Sylvandell was truly patriotic, had given many heroes to the country and still after a quarter of a century held them in fond and loving remembrance. "It is beautiful! beautiful!" murmured Rhoda, as her shabby little boots kept time to the music; her eyes sparkled and her cheeks flushed as red as the Jacqueminots the doctor's daughter was just carrying by as her tribute to the dead.

But at that moment a shrill, high-pitched voice sounded from the house calling, "Rho-dy! Rhody! Wherever in this mortal world air you!" and, with a thud, the child came down from her wooden steed and her exalted height at the same time, and prepared to answer the summons of Miss Jane Ann Pippy, realizing that Memorial Day or not she was still that worthy spinster's "bound girl" and the kitchen was still unswept and the bread still unbaked.

"Coming Miss Jenann, coming right away!" she responded, for Miss Pippy's christian names were always run together, and she was known far and near as "Miss Jenann."

That lady, however, now appeared in the doorway, resplendent in an ancient, but still rustling black silk, and her best broché shawl. A new bonnet with yellow ribbons adorned her auburn head and a still more unbecoming frown her brow. "I declare, Rhody Primrose," she exclaimed: "You air enough to provoke a saint! The most shiftless girl I ever see! And after all I've done for you too! Feedin' and clothin' you for more than ten months, sendin' you to school and church, and sparin' neither pains nor rod to make you good for somethin'! Soon as my back's turned off you go, dilly-dallyin' out o' doors and it long past noon and not half the chores done yet. Now, just stop that moonin' this minute and fly 'round, for I'm goin' over to brother Cy's to dinner and then up to the graveyard to see the doin's and hear the speeches. You can help yourself to a snack of bread and meat in the buttery. S'pose too, I might as well take along them clove pinks and fix up pa and ma's graves a bit. Not that I admire all this Decoration Day nonsense, but I ain't goin' to have neighbors say, 'Jenann Pippy

"IF YOU PLEASE, SIR, IT WAS I."

neglects her parents dead or alive," and, gathering up the pungent little posies as though they had been so many sticks of firewood, the voluble, stirring woman departed, leaving dreamy, sensitive Rhoda to eat her light collation in tearful loneliness, and then to set the house in order, wondering, meanwhile, why Miss Jenann's tones pricked like needles, and if she really was the worst girl in all the world.

A happy thought, however, soon came to dry the salt drops and shine like a rainbow through the mist in the soft brown eyes. She would be very quick and industrious, and perhaps she would have time to run up for a peep, at least, at the Memorial flowers, the poetical idea of which appealed to her most strongly.

"Only I wish I owned a grave to decorate," she sighed sadly. "But I have nobody that's related to me either on earth or in heaven."

Miss Pippy, herself then, could not have found fault with her young handmaiden during the next hour. Brisk as a bee was she, and, when the tiny cottage was as clean and bright as a new penny, and the crisp, crusty loaves smoking on the shelf, she gaily donned her Sunday gown and hat, locked the front door and hid the key under the mat.

But then she came to a sudden pause. "I ought to take some flowers," she thought. "Maybe they won't let me in without," and her glance wandered over the barren garden, until it fell upon the old apple tree with its roseate crown. "Blossoms! Lovely apple blossoms! They will be the very thing!" And, in a trice she was standing on the fence, gathering all the pink and white sprays within her reach and dropping many a tell-tale bunch upon the ground, quite unconscious that she was destroying the embryo fruit in a truly reckless manner. Then, with an armful of rosy bloom she hastened up the hill.

"Oh! oh! oh!" Beauty-loving Rhoda almost screamed with delighted surprise, as she entered the little "God's Acre" and beheld the burst of floral glory which had transformed the usually gloomy spot into a radiant parterre,—and she wandered on and on amid the flower-decked mounds where, here and there, the Stars and Stripes designated the last resting places of those the day was particularly designed to honor. "Every one has a posy! Every single one!" she said to herself. "But, no! There is one without, and ah! How desolate it looks!" She stopped beside an unmarked grave that lay somewhat aloof from all others and very far from the imposing soldiers' monument where the ceremonies chiefly centered and where most of the crowd was gathered.

"Seems as lonely and friendless as I am," thought the fanciful little maid. "And, who knows! Perhaps some girl lies here! Some girl like me, who was careless and forgetful, who swung on the gate and mooned, and was 'shiftless'"; and a great wave of pity welled up in her heart for the forgotten inmate of that weed-covered bed and made her kneel down and heap all her fragrant blossoms in that deserted corner.

She had scarcely completed her charitable task, however, when she heard a passer-by exclaim! "Sake alive, if there ain't Miss Jenann Pippy's gal, a decoratin' old Horace Bentley's grave!"

"Poor child! She don't know any better!" replied a softer woman's voice, while as half startled she turned away, she ran against her friends of the morning — Josie Berry and Rafe Kent.

They, too, appeared astonished and the former cried: "Rhody Primrose! You surely are not putting flowers there! Why, a jailbird is buried in that spot."

"Yes, indeed," added Rafe. "A bad one too. They think he killed a man and might have been hung if he had not died before his trial came off."

Rhoda gasped. Even she remembered the case, which, three years before had excited all the country round. An old and respected farmer living near Sylvandell had been found in the woods holding the head of a young stranger with a white dead face and a crimson shirt front; while a pistol lay by his side. When accused of the dreadful crime he would neither confess nor deny it, so was borne off to the county jail, where he expired in less than two months. "Of remorse," said some. "Of consumption," said others. "Of a broken heart," said the few friends who still trusted in his innocence.

"I-did-not-know," she stammered, but when Josie would have removed the blossoms she detained her, saying: "No, no. Let them stay. They can do no harm, and perhaps he was not so very bad after all."

"But he killed a man," urged Rafe.

"Well, and didn't all the soldiers kill lots of men?" asked Rhoda, glancing up at the tall, towering shaft, half concealed by wreaths and garlands.

"Of course. But that was different, quite different," fairly shrieked Master Kent, in high dudgeon. "It was what they went to war for, and then, they were often killed in return and died for their country!" and, whirling on his heel he walked off, bursting with indignation at the comparison, while little Miss Kent sniffed contemptuously. "Well, I certainly never knew such a queer, ignorant creature!" and followed her companion in equal disgust.

Nevertheless the blossoms remained on Rhoda's "adopted grave," and she did not regret their use when she recalled the white-haired, mild-faced man who—when a wee mite of a child—she had often met near the poorhouse gate and who always had a kind word for the little foundling and a red apple out of his pocket.

"He didn't look the least mite like a wicked murderer," she thought. "And, anyway, there may be somebody, somewhere, who would like to have him remembered on Memorial Day."

It was a very contented little body then that wended her way home in the ruddy glow of a glorious sunset; but, alas! The content quickly vanished when she found Miss Pippy there before her, standing, with a friend at the gate, and loudly bewailing the broken blossoms and the loss of so much expected autumn fruit.

"Here comes the simpleton, now!" she cried; her yellow bonnet strings quivering with rage. "Step up, Miss, and explain your conduct. Do you think I took you in to rob me in this fashion?"

"Rob you!" ejaculated Rhoda, blushing "a celestial rosy red." "Why! I never stole a thing in my life!"

"What do you call it then, to break off my blows in this manner? Don't you know blows mean apples?"

"No, Ma'am. That is I never thought; and I am sorry if I have done wrong. Indeed, indeed, I did not mean to, Miss Jenann."

"Only a slight botanical mistake," laughed the lady standing by. "Overlook it this time, Miss Pippy."

But Miss Jenann was grim Fate personified. "It is my duty, Phyllis, to teach the child better. However, Rhoda, as Miss Busket is here to tea, I will let you off to-night. But you shall go to bed without your supper, and mind, we will have an understanding to-morrow. There, not a word, but off with you at once!" and, dazed and oppressed by a vague sense of injustice, the girl climbed the steep stairs to her attic chamber and sought her little cot, where she lay sobbing over her sins of ignorance far into the morning hours, too hungry and unhappy to sleep, and feeling as though the traditional sword of Damocles was hanging over her golden head.

Meanwhile, in the cozy front room below, Miss Brisket and her hostess were enjoying a combined dish of tea and gossip, and reviewing the events of the holiday.

"Powerful good address that, the parson gave us," remarked Miss Pippy as she helped out the early strawberries. "And the posies were as plenty and purty as I ever saw 'em. Guess every mound had something onto it, unless 'twas Horace Bentley's, and he, accordin' to my way of thinkin', ought not to lie there at all."

"Well, now, Jenann, I don't know about that," said Miss Brisket, who was as round and jolly as her friend was lank and severe. I met Dr. Hazlett out here, and he says, "Sylvandell is going to change its opinion about that affair, and pretty soon too. It seems Robert Bentley—old Horace's son—has come back from foreign parts where he has been for years. He got here this afternoou and has summoned all the town wardens and selectmen to meet him down at the hotel."

"You don't say so! What for?"

"To clear his father's name to be sure. He says Horace Bentley never killed the young New Yorker at all, but let people think he did, so as to shield and turn suspicion from the real criminal, who shot the stranger in a fit of passion."

"Dew tell! And who was the real criminal?"

"His brother Dick, a harum-scarum chap, twenty years younger than he. Horace was devoted to this brother, who was left to his care when a mere baby—though he always gave him a sight of trouble,—and it appears he had promised his mother to always stand betweeen the boy and any harm. So he let the rascal escape and went to prison in his stead. But Dick has just made a written confession on his death-bed, and Robert means to publish it and right his father before all the world."

"I don't blame him for that."

"No, indeed. It was a sort of grand thing for a man to do. Dr. Hazlett says he believes Horace knew he had consumption and could not live long, and he loved his brother so much he wanted to give him a chance to repent and turn over a new leaf."

"Well! That does beat all! Reckon it will make something of a hubbub in this town. If you've finished, s'pose we step over and tell Miss Berry the news. I don't believe she has heard it, and Rhoda can wash up the tea-things in the morning."

But when morning came Rhoda was not there. The attic nest under the eaves was empty, the bird had flown."

Waking in the gray dawn from a short, restless sleep the little girl began considering that coming "understanding" with Miss Pippy. These "understandings" she knew of old and dreaded as only delicate, sensitive natures can dread. Should she stay to meet it? No, she would run away first. But where? That, she did not stop to consider, but, slipping on her clothes and gathering a few small treasures together, stole softly down stairs and out into the sweet, dewy May world.

Away then she sped out of the village and up the hill, anywhere, anywhere, so that she was no longer "Miss Jenann's bound girl." Suddenly she found herself at the entrance of the cemetery and paused to peer in. How calm and peaceful it looked! Yesterday's flowers somewhat withered but still sweet. "They will never think of looking for me here," she thought, and, beginning to feel the fatigue of reaction—she wandered down to her "adopted grave," and sat down to rest. A bird in the treetop chanted a low matin song, the insects kept up a drowsy, monotonous hum, and soon, lulled by these gentle lullabys, Rhoda's eyelids closed, and she stretched herself out on the long, unmown grass.

She was awakened at last by the sound of many voices and distinctly heard some one exclaim: "Well! Gentlemen! This was kind! So you did not even let my poor father's dishonored grave go undecorated on Memorial Day. You, doubtless, remembered that he, too, fought for our country; but it was not there he showed his greatest heroism. Ah, believe me, there are more heroes in private life than on the battlefield."

"True," responded Judge Dow, looking rather embarrassed. "But I am afraid, Mr. Bentley, we do not deserve the credit you give us. The town adorned no private graves and who placed these flowers here I really do not know."

"If you please, sir, it was I"; and the masculine quartette started back as a slender figure seemed to rise from behind the mass of bloom, the fresh, little pink and white face appearing not unlike a personified blossom."

"Hollo!" shouted genial Dr. Hazlett. "If it ain't little Rhody Primrose! Whatever brings you here!"

"And why," asked Mr. Bentley, "did you place these flowers on this mound?"

"Because," stammered Rhoda, "it looked so lonely, and—and—I thought somebody might like it."

"And somebody does. Somebody likes it very much. These blossoms have made me happier than I have felt for three long years. But who are you, my kind-hearted little lady?"

"O, sir, I am—that is I was—Miss Jenann's bound girl. But I have run away, and please, please don't send me back."

"Never, against your will," while the wardens opened their official eyes in surprise.

"I'm afraid Miss Pippy is not an ideal guardian for a girl," chuckled the Doctor. "She isn't exactly what one would term motherly."

"So!" and Mr. Bentley seemed revolving something in his mind. "Do you know anything of this child, Judge?" he asked at length.

"O, yes. She was the ward of the town for some years, and was called the pet of the poorhouse."

"Her sweet face is a recommendation anyway, and it seems more than a coincidence that I should find her in this spot. The fact is, gentlemen, my wife has long wished to adopt a little girl, and I seem to feel like a father already to this pretty

waif." As he spoke, Robert Bentley held out his hand to Rhoda, who after one searching look into his face, slipped her slender fingers into it and, together, they went down the long hill to the tiny cottage under the apple tree.

"Little Rhody will get good interest on her blossoms if Bob takes her to his fine city house," laughed Dr. Hazlett, fairly scintillating with satisfaction; and Judge Dow and the other wardens nodded a pleased assent.

So Miss Pippy had a somewhat different "understanding" from that she had anticipated; but, finally, for a consideration, was induced to renounce all right and title to her small "bound girl," while happy Rhoda felt as though she must still be swinging and dreaming on the old gate when whirled away to a luxurious city mansion and clasped in the arms of a fair, gracious lady who fondly welcomed her to her heart and home.

And how the little maiden's sweet, sunny nature expanded in this new atmosphere of love, making her adopted parents rarely proud of their transplanted, country primrose; while one year later she had the pleasure of again visiting Sylvandell and being present at the unveiling, on Memorial Day, of an exquisite monument above the grave of noble Horace Bentley.

On the base were engraved these Scriptural words, "Greater love hath no man than this; that he lay down his life for his friends," and round them twined a graceful wreath of apple-blossoms, carved in unfading marble.

Relics of Prehistoric and Indian Races.

CHARLES H. COE.

The object of this article is to give the readers of the AMERICAN AGRICULTURIST a brief description of some of the burial mounds of the prehistoric and fast-disappearing Indian races, located in western North Carolina, the mountain section of the State, and on the Eastern coast of Florida, also descriptions and illustrations of some of the more rare and interesting relics found in Western North Carolina on the sites of old camps and villages. Comparatively few persons know what a large number of stone implements were manufactured and used by the mound builders. Arrowheads and clumsy stone hammers and axes which have been found, more or less, in all parts of the United States are quite common, and almost every one has seen numerous specimens. But there are a great many interesting and curious relics which the average person never saw or heard of, known only to collectors and persons especially interested in this subject.

FIG. 1. KNIFE BLADE.

Who made these implements? Who were the mound-builders? The Indians, or a race of people who inhabited the country before the red man—away back beyond all traces of history? Who can say? Much has been written in relation to this matter by archæologists and others, but it is still enveloped in more or less mystery. It is generally believed to-day, however, that many of the mounds located in different parts of the country are of prehistoric origin, as are numerous stone implements found in the mounds or elsewhere. It is also a fact beyond dispute that several of the Indian tribes—among them the Cherokees, who inhabited Western North Carolina—buried their dead in mounds, made expressly for that purpose, and that they also made numerous flint and stone implements and weapons. It is probable

FIG. 2. ARROW HEADS.

that the Indian, discovering that the race of people who inhabited the country before him buried their dead in mounds, adopted the same custom. In Europe stone and flint implements made by the hand of man have been found among the remains of extinct species of animals, in deposits of "drift," so called by geologists. These articles are very similar to those found on the surface of the ground in America, but are generally larger and of ruder workmanship.

In Macon county, Western North Carolina, there lived, about twenty years ago, an old Indian named Otter. When he died he was believed to be one hundred and twelve years old. He gave the early settlers very interesting accounts of battles and incidents which occurred in what are now known as Macon and Jackson counties. There is a large burial mound near Franklin, Macon county. Otter told some of the oldest inhabitants now living that this mound used to have large trees growing upon it when he was young. It has been without trees as far back as the oldest settler can recollect, and Western North Carolina is famous for its aged people. Otter used to say that the mounds were not made by the Indians, but by a larger race of people who lived here long before they came. Whether or not there is any truth in this story, which some of the oldest inhabitants still relate, I do not know, but it coincides in some respects with the following statements in regard to burial mounds on the east coast of Florida; which can be relied on.

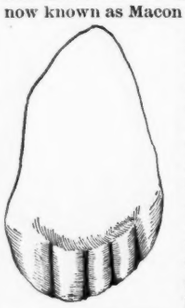


FIG. 3. STONE FOOT.

The writer lived for over twelve years on the Eastern Florida coast, and had numerous opportunities to examine several burial mounds in that part of the State. There are several mounds in and near the town of New Smyrna. This place is next to the oldest town in the United States, St. Augustine being the oldest. About a year ago the writer found among a collection of old books in Hartford, Conn., one written in 1775, by Captain Bernard Romans, on the peninsula of Florida. That this early history of the State is really valuable will be known by the fact that a copy of the work sold at an auction sale of books in New York city, about two years ago, for nearly three hundred dollars. Captain Romans lived at New Smyrna for some time previous to writing his book. In his book he speaks of the mounds referred to above, as "tumuli for the repository of the dead," and says that some of them were used for building sites. (This latter fact is still the case, houses being built on them for the elevation they are thereby given—from ten to thirty feet.) On some of these Florida mounds there are large trees growing; in several instances wild orange trees cover their tops and sloping sides. The mounds are of two kinds, one made of shells (mostly shells of the oyster) and decayed vegetable matter, and the other of pure sand. The writer and a friend opened one of the latter kind, a few years since, and took out over twenty skulls, with bones belonging to different parts of the human body. Only two skulls were removed entirely complete, the others breaking more or less. The remains indicated a large race of people; the jaw bones, for instance, would fit completely over an ordinary man's chin and jaws. The teeth were all perfectly sound, and had been worn down evenly all around, as though their owner had done a deal of "grinding." The bodies seemed to have been buried after a battle, as they were lying very close together. There were several skulls in sight when we stopped work. Nothing was found in this mound by us but the remains of skeletons, but a friend afterward found a quite common article, viz.: a stone about half the size of one's fist, slightly conical at one end, to fit the closed hand, and broad on the other, with a concave and convex sharp edge; it was evidently used for scraping skins, or for some such purpose.

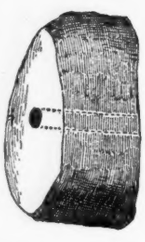


FIG. 4. SMALL STONE AX.

Among the lofty mountains and beautiful valleys of Western North Carolina, particularly in the southern portion of this territory, was the home of one of the most powerful and warlike of Indian tribes, known as the Cherokee. Their villages were located mainly in the valleys, on the banks of rivers and large creeks, as evidenced by the greater number of relics found in such localities, particularly such as pieces of pottery ware, used in the preparation of their food. Several of their burial mounds are still to be seen in different parts of the country; others have been dug into and leveled down by parties in search of relics. There are still several large mounds in Macon and Jackson counties in their original state. In three localities known to the writer, all on the banks of

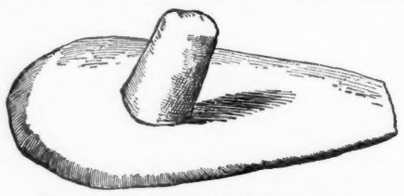


FIG. 5. STONE FOR SMOOTHING SKINS.

creeks, can be seen the sites of old work-shops, where arrowheads are lying around, and the ground is covered with "chips" broken off during the process of their manufacture.

Quite a curiosity is seen in Fig. 1. This was evidently intended for a knife-blade its shape being almost exactly like the large blade often found in a cheap jackknife. It is made of a very hard material, probably a variety of quartz. The rear end is fashioned for attaching it to a handle, after the manner of some arrow heads.

The arrow heads (Fig. 2), are not the common kind usually found in other sections; this kind was attached to the shaft in a different manner from the common barbed head. The small toothed head is peculiar; it may have been designed in this way to prevent its entering a wound.

Fig. 3 is an almost perfect model of a small foot, made from a hard, liver-colored stone, and polished quite highly. It was probably used for an ornament or idol. It is three and one-eighth by one and three-fourth inches.

Fig. 4 is a small double-bitted ax or hatchet,

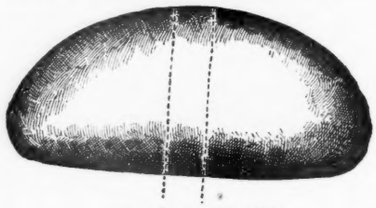


FIG. 6. TOMAHAWK.

used no doubt for fine work. It is two and three-eighths inches long by one and one-half inches wide, with a hole seven-sixteenths of an inch in diameter entirely through it.

Fig. 5 is a curiously-shaped stone, five and one-half by one and seven-eighths inches. The under side is smooth, which, with the handle or knob on the top, seems to show plainly that it was used for smoothing skins, leather, or other material.

Fig. 6 is a tomahawk; it is four and one-eighth inches long, one and seven-eighths inches wide, and three-fourths of an inch thick where the handle went through. The hole, which extends entirely through, is seven-sixteenths of an inch in diameter, and nicely bored. Both ends or edges are sharp, tapering gradually from the middle.

In Fig. 7 we see another style of tomahawk, entirely different from Fig. 6. It is a little larger than the former one, and one and one-half inches thick. It looks like a huge double-pointed tooth. It is rounded throughout, without sharp edges, but pointed at each end. The hole extends through

FIG. 7. ROCK TOMAHAWK.

from bottom to top, and is one-half inch in diameter. It is made of very heavy, hard rock. In the hands of a powerful man, expert in throwing such a weapon, what a terrible wound could be made!

Fig. 8 is probably a prehistoric pickax for min-

ing. It is well known that mica and copper were mined in different parts of Western North Carolina by some race who were here before the Indians. Some think it was De Soto and his followers, but this is generally believed to be improbable. This implement is time-worn, and is one of many somewhat similar found in this territory. Its length is five and five-eighths inches; diameter, two and seven-eighths inches; it is rounded throughout, with pointed end.

Large quantities of pottery, supposed to have been the work of the Indians, is found throughout the county. An acquaintance has a pot eleven inches in diameter at the widest part, broken into

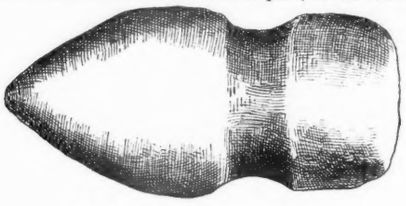


FIG. 8. PREHISTORIC PICKAX.

several pieces on removing from the ground. It is shaped as nicely as could be done at the present time, and is really quite ornamental. The middle bulges out, and the rim is curved back, forming a flange nearly two inches in width. The sides are ornamented with diamond-shaped designs.

Many of these relics of by-gone races show an ingenuity equaled only by our best mechanics today. Our axes and knife-blades are made after much the same pattern. We could not make tomahawks out of stone which would be better adapted to the purpose they were intended for. Their arrow heads could not be improved upon for cleaving the air and making wounds. And when we take into consideration the rude tools they must have used for making their implements and weapons of the chase or warfare, it is indeed wonderful to what skill they attained in their manufacture.

Marbles.

HENRY D. TAYLOR.

"Just one game, Uncle. It won't take long to tell how to play one game."

These were the words that were spoken by my nephew, just as I had taken a book and settled myself for an hour of reading. I knew it was of no use for me to say no, for this little fellow was so persistent there was no getting rid of him until he had gained his point; but I tried.

"You know more games of marbles than I ever did, without my telling you any more," I said.

"I don't know about that. Even if I do, those you tell me are always better."

This settled it; so I put away my book and went out into the woodshed, and got a piece of pine board and cut it out like the illustration:

"What are you going to do with that?" he asked.

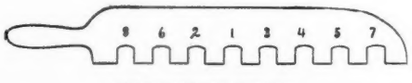
"Did you never see a marble board? Well, I am going to make you a marble board, and show you how to play that game."

"O, that will be splendid. Did you have one?"

"Yes, I had one made just like this."

"Why don't you have the figures run right along in order?"

"Because that would make the large numbers all come together. You see now the large ones are on



THE MARBLE BOARD.

the ends of the board, and the chances are in favor of rolling the marble outside of the board entirely if they try to get big numbers, while if they try to keep safely within range of the board the chances are that they will get the smaller number if they get any. They will risk getting a small number rather than risk rolling by the end of the board."

"Yes, but how do you play?"

"The owner of the board—"

"That's me!"

"Yes; you measure off ten or twelve feet, just as the players agree, and hold the board. Of course any number of boys can play. You agree to give the player who is so lucky as to put a marble through one of the holes as many marbles as the figure above the hole calls for. Thus, if he goes through eight you give him eight marbles and the one he rolls; if he rolls through one, one marble and the one he rolls, and the same for any hole, always returning the one he rolls with as many as the hole calls for. Every marble that hits the board or goes by the end belongs to you."

"But won't I get all out of marbles quick? Every one will roll through."

"I think you will find that in the end you will have the most marbles. The roller has more chances of missing than he does of hitting. You see there are nine pieces of wood to make the eight holes, besides the chances of rolling by either end. This makes eleven chances in your favor to eight in favor of the rollers. This should be so, too, for at each roll he only risks one marble, while you risk at most eight, or at least one."

"That is splendid! I think we will all like that. I'm going right off to play now. I'm ever so much obliged."

And the boy went off happy, while I went back to my book with the consciousness that I had lost half of my reading hour, but with a feeling that it had been much better for me than if I had been selfish and refused the request of the boy.

Prize Puzzle Contest.

For the ten best lists of answers to the following puzzles we will give ten books, as follows:

For the first best list we will give a copy of "Everybody's Biography."

For the second best list a copy of "Lives of our Presidents."

For the third best list a copy of "Dictionary of American Politics."

For the fourth best list a copy of "Ready for Business."

For the fifth best list a copy of "16 Old Maids."

For the sixth best list a copy of "16 Old Maids."

For the seventh best list a copy of "A Boy's History of the United States."

For the eighth best list a copy of "A Boy's History of the United States."

For the ninth best list a copy of "Knitting and Crochet."

For the tenth best list a copy of "The Arabian Nights."

These prizes will be forwarded postpaid to those who send the best ten lists of answers. We do *not* offer prizes for every list sent in, but only for the ten best lists. Answers must be mailed on or before the 20th of this month to "Puzzle Editor," AMERICAN AGRICULTURIST, 52 and 54 Lafayette Place, New York.

1. LONG DIVISION.

In the following example letters are used for figures, according to a fixed plan; that is, if A stands for two in one place, it stands for two in every place. Required, the answer in figures.

```
EI)TARIOP(POIPR
  EI
  --
  ETR
  ECR
  ---
   ENI
   ENC
   ---
    CO
    EI
    --
    PPP
     TU
     --
     EA
```

2. ANAGRAM.

Send Una a gas stove. (The answer is one word.)

3. WORD CHANGING.

Change blue to pink in nine moves. (Only one letter must be changed at a move. Example, change heat to cold in four moves: *heal*, *held*, *hold*, *cold*).

4. HIDDEN STATES AND CITIES.

Ma, Inez has lost her dove. Ralph says a colored man stole it.

This cream is sour; its sale must be stopped, Carrol, and the cans thoroughly cleaned.

(Each paragraph contains one State and two cities.)

5. DROP-LETTER PUZZLE.

—o—m—n—s—. (The answer is one word.)

ANSWERS TO MARCH PUZZLES.

1. Philoprogenitiveness.
2. Massachusetts (mass-say-chew-sets.)
3. Coriolanus.
4. EIDER
   INANE
   DARNS
   ENNUI
   RESIN
5. Kale.
6. If writing for favors inclose a postage stamp.

Life in a Leaf.

STELLA LOUISE HOOK.

If you have seen the garden plants despoiled of their foliage and the elm leaves riddled with holes, you may guess what a host of little creatures find pasturage thereon; but it may be that you are not acquainted with the tiniest of all the caterpillars, called leaf-miners. Just think how it would feel to be so small that a thin leaf like that of the maple would seem to you as thick as a one-story house, and as long as a whole town! Can there really be such tiny beings in the insect world?

Well, there is a leaf on my rose bush that represents the whole world to a certain little caterpillar, who has probably no idea that there is anything beyond his narrow green horizon, unless he may chance to remember how on a summer morning, days ago—for days are probably to him what years are to us—he crawled out of the smallest egg you ever saw, that had been laid on the leaf; and how, led by an instinct we cannot understand, he bored his way into it to feast on the soft green pulp between the upper and outer surfaces. Since then he has never seen the daylight, but eats his way slowly along, tunneling through the leaf and wandering in whatever direction his fancy leads him.

FIG. 1. THE TINY CATERPILLAR.

Now, it is not the outer skin of a leaf which is green, but the juicy part within; and of course if the caterpillar eats all this green part away the leaf will look white or yellowish in that place. And so it comes to pass that our miner's path in life is traced out by its lack of color, and looks like a white thread run through the leaf, lying in all kinds of curves and loops. If you open the leaf very carefully you will find at the end of this crooked tunnel the wee creature that has formed it; but you will need a magnifying glass to see that he is a real caterpillar, with six legs and ten prolegs—with sharp jaws to bite the leaf pulp; a caterpillar that will turn into a moth some day, just as the great green ones do that live on the plants in the garden. Fig. 1 shows him as he is seen through a magnifying glass. I wonder if he knows what is going to happen to him, and if he ever thinks of it while he is groping about in the dark interior of his leaf? However that may be, the time is coming when the feeble little leaf-miner shall exchange this tiresome existence for winged freedom among the flowers.

FIG. 2. THE GROWN-UP MOTH.

Perhaps you have seen the chrysalides that larger caterpillars turn into, to sleep for awhile before they come forth as butterflies or moths with spangled wings. This caterpillar forms a chrysalis too, after he has burrowed in the leaf long enough, and you can imagine what a little one it must be. In it he lies as if dead, far more helpless than when he was crawling about eating the green pulp; but after a time he becomes active, breaks his fetters and comes out into the sunshine at last a grown-up moth. Fig. 2 shows the moth greatly magnified.

And of all fairy-like and dainty creatures these little *Tinea* moths are the prettiest. They are well named, for they are all tiny, in their grown-up as well as in their caterpillar state, and you must again resort to the magnifying glass to see their full beauty. But even without this aid the feather-like wings and delicate colors of our little friend look very pretty in the sunshine as he rests on the leaf, within which he dwelt so long, a moment before flying merrily away over the flowers. But the long, crooked tunnel remains in the leaf to show where the brave little miner worked his way through the darkness to light and freedom.

Grape Growing in the South.

Grape culture is fast becoming one of the leading industries in Florida, Alabama, Georgia, South Carolina, and Tennessee, where numbers of vineyards cover hill and dale and yield abundant crops of fruit. Florida, especially, with its semi-tropical winters and protection from the "tail ends of blizzards," has climatic advantages which enables it to grow and place early grapes on the market long before its more northerly neighbors can boast of even a "rare ripe bunch." Until recently a few choice vines, or an arbor in the garden or door yard, and for ornament home use only, filled the measure of grape culture in the "Land of Flowers," although the woods, swamps and hill sides teem with native vines. But now many persons have gone largely into growing grapes as a business, and thrifty vineyards are to be seen in almost every section of the State.

Perhaps the most representative are the vineyards of Mr. Louis Du Boise in Leon county, one at his home place, some two and a half miles from Tallahassee, and the other at Lake Jackson, about seven miles distant, and both in full bearing. Mr. Du Boise was born and brought up in one of the famous grape growing districts of France, and when he visited the "Tallahassee country" became impressed with its adaptability and superior advantages for grape growing. The lands are rolling and hilly, with red clay subsoil and a top-soil of sandy loam. He bought a "wornout plantation," cleared off the briars and bushes, planted his vines and in three years had his fondest hopes more than realized in seeing the vines loaded with delicious grapes. Since then he has been adding as fast as possible to the acreage planted until the vineyards are the pride of their owner and the source of a handsome revenue.

Mr. Du Boise has tried numberless varieties, American as well as foreign, and considers as the surest and most prolific bearers the Concord, Niagara, Delaware, Norton, Ives and Worden. The vines are planted about four feet apart in rows eight or ten feet apart, and are trained on two or three lines of strong wire stretched from stout posts. The cultivation is done with plow, harrow and hoe. "Woods' loam," the top soil and rotted leaves from the forest, are largely used as fertilizers, and a crop of peas or Spanish clover sown between the rows after the grapes are gathered and plowed under when knee high give the best results; the canes are cut back every winter and the vines properly trained. The cost of last year's crop for cultivation and picking was less than twenty dollars per acre, while the returns were more than two hundred dollars per acre.

These vineyards are by no means exceptions, for many others have been very successful. Capt. W. I. Vason, of Tallahassee, bought an old farm for two dollars and a half an acre and planted several acres of it in vines. In less than four years he could have sold his vineyard for four hundred dollars an acre. Although grapes grow so abundantly, they find ready sale, being from two weeks to a month earlier than those grown farther north; and the readiness with which they are put on the market in New York, Philadelphia or Washington inside of forty-eight hours fresh from the vine, will make the grape crop one of the most important and profitable of that favored section.

The scuppernong is the native species, and a single vine, trained up a post and on trellis work, often covers half an acre of ground, and vine and branches at ripening time are literally one mass of fruit; the fruit, though it has a thick rind, has a rich, luscious pulp of fine flavor and makes excellent wine, as well as preserves, pies and pickles. FRANK PHILLIPS, Leon Co., Fla.

Women Farmers in Germany.

On a properly conducted German farm nothing is wasted, and this is largely owing to the active part taken by women in the farm work and management. The raising of poultry depends entirely on women. On a large place the geese have an extra maid, who cares for them, and if they are driven on some meadow, or after the harvest on the stubble fields of wheat or other grain, they have a herder, or several, if necessary, generally children from ten to twelve years. Village people also send their geese out every morning, and have them returned at night. Pigeons are regularly fed twice a day and kept in a separate place. They are not allowed to roost all over the barn where they are not accessible, but are shut up every night, that no hawk or other enemy can disturb them. About Easter time the first crop of young birds is sold at high prices. The famous Pommerania smacked geese breasts are all prepared by country women. Vegetables are raised by women, and even in villages and small cities every family maintains a garden in the suburbs, to have as much fresh diverse fruit and vegetables as possible.

Flax is raised in small quantities by most families. It is worked by women and made ready to be spun during winter evenings. Large chests of fine homespun linen represent considerable money value, and descend by inheritance from generation to generation. The milking, butter and cheese making, calf fattening or raising is done by women. Fruits are dried, baked or preserved, to be sold in the regular fall markets. Nearly everything used on the farm for man or beast is raised there. The prevailing custom here is to learn and understand all work to be done in the house and on the farm. "You may need it sometime," is always the maxim of the elder people when they impart their knowledge to the younger members of the family. As a result of this work in the house and in the garden the country women of Germany are strong and healthy, and prefer fresh air and sunshine to the confinement of the shop and factory. MRS. WILHELMINE SELIGER, Wuertemberg, Germany.

The Colorado Rainbelt.

Rainbelt is the euphonious name for a portion of what was once called the Great American Desert, which the American homesteader has undertaken to bring into cultivation. The severe drought of last year succeeding as it did similar experience in the preceding years has almost depopulated not only Eastern Colorado, but also Western Kansas and other districts, which are as yet without means of irrigation. In Eastern Colorado there appears to be an ample supply of sheet water, while in the western parts of Kansas and Nebraska the underground water is said to run in veins. It is thought possible that these water supplies can be raised up for irrigation purposes by means of artesian wells.

The possibility of becoming the owner of 160 acres and possibly of 480 by using all of the three rights every settler has had, viz., the preëmption, timber claim and homestead rights, has had a great attraction for many who had little or no means, and not much experience in farming. These have now with few exceptions again left their land to make their living by laboring in cities. The men who still remain are mostly practical farmers and though they have barely made a living, they are loath to give up the struggle. There is something fascinating in the climate of Eastern Colorado. The effect of settlement has been thus far only a very limited breaking up of the surface, a few acres on each quarter section that has been taken up, and such of this as has been abandoned by settlers is going back to weeds. There is no law compelling a man to cultivate his land after he has once received title to it, and as the title to much land is now passing to the Farm Loan Companies, who made loans to the original settlers, this year will see much less land under cultivation than in preceding years and a standstill must ensue in the development of Eastern Colorado. This is to be regretted because a more general breaking up of the prairie surface and increased cultivation would bring about a change in the climatic conditions and increase the precipitation of rain. Heavy rain clouds now often hang over plats of cultivated land, ready to burst. It seems as if they were held there and yet they do not discharge the rain. They finally blow away and while the grain plat on heavy dark land is drying up, the light open soil with luxurious wild vegetation in the hollows and slopes around the long structures of sand-hills is favored by heavy rainfall. The light, sandy soils thus far have offered the best returns, besides being much easier to cultivate. It is however only by mixed husbandry, that is by raising cattle, horses, and hogs, and growing rough feed for use in winter storms, that any profit can be realized. The very nutritious qualities of the prairie grass make it excellent grazing, and it is always possible to raise sufficient corn and rough feed in the light sandy soils to carry the stock through occasional snow storms, in which they cannot graze. Eastern Colorado is a fine stock-raising country and it can doubtlessly become a good dairy country, but this requires more capital than is usually in the hands of pioneers. A disagreeable feature is the town booming and curse of litigation under which the country suffers. Contests over county seat locations, contests over town sites and over claims, and litigation of every conceivable kind abounds. The mirage of future town grandeur is conjured up by the boomer in posters and handbills, which are scattered through the Eastern States. Projects of vast additions to villages having scarcely a hundred inhabitants are launched, when it is self-evident that in a country dependent solely upon agricultural development their mission is confined to being small trading points for the surrounding country. Before there is even a grain shovel-house or a creamery in prospect irrepressible hustlers rave about electric lights and street cars, and the Eastern mail brings them orders for building lots way out on the prairie, on which for many a decade yet cattle will graze.

VON HORRUM SCHRAMM, Yuma Co., Colo.

California's Greatest Industry.

The inhabitants of this far Western land were attracted here in the primitive mining days not as agriculturists but as miners, almost exclusively. In more recent years California has taken on new life, and to-day where one man comes to California as a miner there are ten who come to cultivate the soil. It is safe to assert that California is a far richer agricultural country than she ever was as a mineral producing land.

Fresno county is situated in the center of the San Joaquin Valley, and this is in the Basin of California. Wheat farming has been the leading industry here until the last few years. At present horticulture is gaining fast, and will soon leave all farm production in the rear. About the 1st of February is the time, generally, that all wheat farmers aim to finish plowing for that crop. The Valley portion of Fresno county is comparatively level, and embraces about two and a half millions of acres. The soils are diversified, though the white ash and sandy predominate. Our wheat, previous to sowing, is treated with a solution of bluestone in order to prevent smut. Some wet the wheat and sprinkle lime over it. Others take their wheat out of the bluestone tank and use the lime also, claiming that this mode is a sure preventive of smut, and that the lime acts as a fertilizer to a great extent. The wheat in most cases is sown from seed sowers, which are rigged on the gang plows. These carry from three to six ten inch plows, and are drawn by four to eight horses. A six-horse team will handle 320 acres of this wheat land where the soil is of the ash or sandy nature. The wheat is harvested with headers and combined harvesters. The stubble is utilized as pasturage up to wheat-seeding time again, and I have known wheat to be raised on the same land in this valley for thirty-five consecutive years without a decreased average yield.

JAMES E. DONNELL, Fresno Co., Cal.

The Oregon Fruit Market.

A fair average of the quoted prices of fruit for last year would be about as follows: Strawberries, eight cents per pound; raspberries and blackberries, six cents; peaches, five and six cents; plums, one, and one and one-half cents; pears, two and two and one-half cents; apples, one, and one and one-half cents; currants, four and six cents; cherries, three and five cents.

Cannery prices were somewhat lower for the whole crop. Of course this was for the better class of fruit of which we have not half enough to supply the demand. There is a great quantity of an intermediate quality produced that at present goes to the local markets at a lesser price, but this will be cast aside as soon as enough first-class fruit can be produced to replace it.

Large tracts of good fruit-growing land are being put upon the market at reasonable rates. A class of live, enthusiastic horticulturists is taking possession of this interest; transportation rates will be reduced to meet the growers' reasonable demand, and everything at present looks most

favorable to the rapid development of this long neglected interest in this section.

Our legislators realize the importance of the fruit interest, and are wisely providing for its protection and encouragement. This fact alone is significant enough to the wide-awake horticulturist. A State protects its most important industries. When a young State like Oregon protects its fruit industry by stringent legislation, it speaks volumes for her capabilities in this direction.

On the whole, this northwest coast, including Oregon and parts of Washington, is an admirable location for the intelligent, energetic horticulturist. The shipping and carrying facilities are being rapidly developed.

E. R. LAKE, Benton Co., Oregon.

The Agriculture of Jamaica.

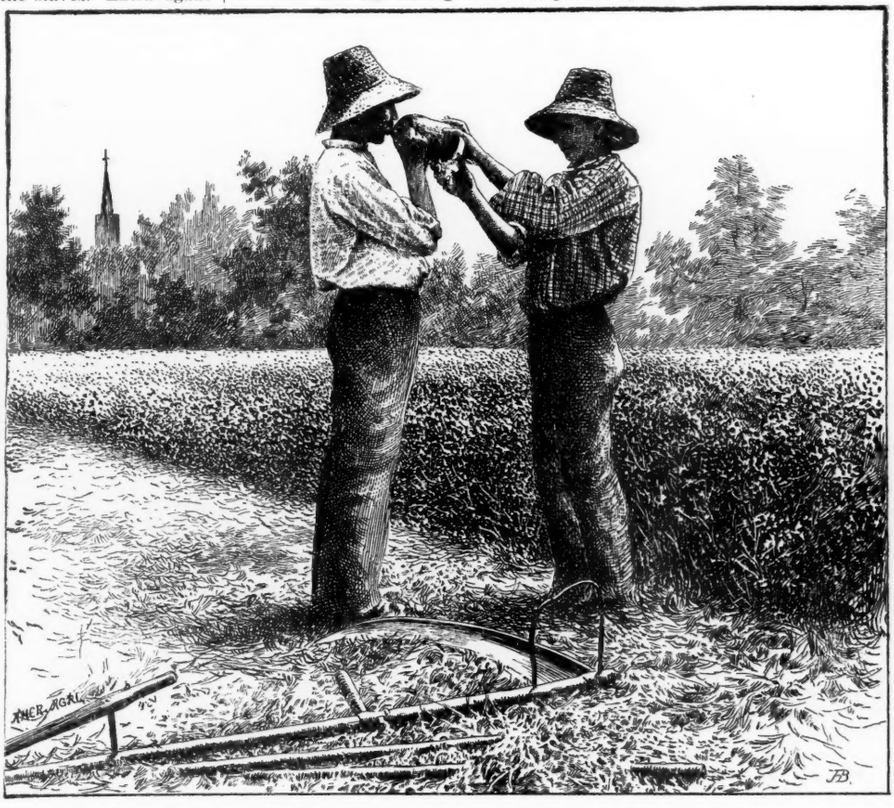
The principal products of this Island are coffee, pimento, ginger, and fruit. The sugar industry, which was once the staple product of the Island, has fallen almost entirely to decay. The main causes of this are the fall in the price of sugar, and the difficulty in obtaining regular labor consequent on the freeing of the slaves. Extravagant management has also had something to do with the result. The coffee growth is going the same way, and is also due to the scarcity of labor. The colored people prefer to invest in land, and work upon it for their own profit. They migrate from the open plains to the hills, where land is more easily obtained. In these parts a thriving peasant proprietary has sprung into existence, and they have become the principal producers of fruit—an important industry in the Island. It may seem strange that the sugar growers did not pay greater attention to the markets, and secure themselves against the approach of low prices. But very few proprietors lived in the Island, the plantations being left in the care of overseers, who generally made their "pile," and left their employers to take care of themselves. The estates yielded an ample revenue years ago, and this begot lavishness and carelessness in the owners. To show how things have changed during the past fifty or sixty years in Jamaica it is only necessary to say that the average charges on a sugar estate for attorney, bookkeepers, merchant and commission amount to twenty per cent before the proprietor receives a dollar. England's policy of sugar bounties has helped to ruin the culture in Jamaica, as has also the improvements in the cultivation of beets. Some experts think that if more scientific energy were put into the production of the sugar cane, and if the same system of production adopted in Louisiana and the French West India Islands were tried in Jamaica, the industry could be made to pay, especially by the planter giving all his attention to improving the cultivation and the quality of the cane.

The production of fruit, principally of bananas, has increased during ten years from $500,000 to $1,685,000, and Jamaica bananas are now sent to Hamburg via New York. Tomatoes are largely in demand, and heavy crops are gathered in the Island to meet the orders received from the United States. With the improvements in agriculture will come a demand for implements and machinery, a hint which American exporters of these goods may remember. A year or two ago a prize of $250 was offered by the London Chamber of Commerce for the best samples of tobacco grown in British colonies; Jamaica divided the award with Borneo. Active steps are being taken to introduce and promote the cultivation of fiber plants. There is a large demand in Jamaica for plants of sisal hemp, which are being propagated by the Botanical Department in the Island.

T. FLEET, Kingston, Jamaica, W. I.

A French Characteristic.

The French never waste anything, nor do they let go the bottle in a harvest field treat. Though its contents are probably beet rum, the owner, or sharer, will not be beaten out of a single swallow, as is seen in the illustration, by the safe angle the bottom of the bottle droops from the anxious lips. Only a taste *s'il vous plait*. Though wine, cider, and beer are pretty freely drank in the north of France, the cider is hard, and the raw, biting cider brandy, or beet brandy, is still rawer and more biting. The quality of the common wine in the Nord is not so good as that of cider. In harvesting, something more stimulating is used. A Frenchman thinks a good deal of a franc, and twice as much of a franc's worth of rum. A laboring man to a laboring man seldom displays anything like generosity. But this does not hold good of the peasantry to



THE CONFIDENCE POINT IN A FRENCH HAY FIELD.

strangers. I have been offered wine first, which I drank out of politeness; cider next, which I tasted for the same reason; but the cider or beet spirit even politeness failed to make me drink. Drunkenness is extremely rare in France, though wines are freely used. The pure fermented juice of the grape is cheap, too cheap to adulterate, especially wine from the second pressure. American wines are infinitely better than a great part of the French wines, a fact which is readily admitted by the French themselves.

A. S. ERICUS, Lille, France.

A Rich Dairy Region.

Caledonia county, Vermont, is one of the richest dairy sections in the East. No other county except Franklin exceeds it in aggregate yield of butter, and for quality it takes the lead in the State. Great pains are taken by dairymen to keep their butter up to a high standard of excellence, the desire being to make goods that will suit the consumer. The next step for dairymen to take is to learn how to raise the grain-feed fed to their cows off their own farms. Vermont soil is capable of producing all the feed that is now fed to milking stock. The amount of money now paid for feed from the West and South is truly appalling, notwithstanding that oats, barley, and even corn can be profitably raised in all parts of the State. On the higher lands of this State an early variety of corn will yield a good crop in almost every year.

HENRY BLAKE, Caledonia Co., Vt.

Wyoming Coming to the Front.

Johnson county, Wyoming, is about the center of what will in the near future be one of the best agricultural districts in the Northwest. There are now four railroads projected, and some being constructed, into this section. This will give us transportation for our produce, which is only limited by the demand. Our flour, which is of the best quality, will be shipped to all parts of the world. Potatoes we can raise in unlimited quantities. In favorable seasons we often raise 450 to 600 bushels per acre without manure; we seldom raise less than 300 bushels, no matter what the season may be; for, with an abundance of water, we can defy the droughts. Good government land may be taken up for $1.25 per acre. Fort McKinney is two miles west of Buffalo, at the foot of the Big Horn Mountains, and is now occupied by about 500 soldiers, who have a very fine band. On pleasant evenings they give fine open-air concerts, which the ladies and gentlemen of the town go to hear. The amount of produce consumed at this Fort is astonishing. The supplies for the coming fiscal year will be about 1,000 tons of hay, 2,000,000 lbs. of grain, 4,000 tons of coal, and 2,000 cords of wood. This will give us a market for our produce, at fair figures. Prices are ruling rather high this spring; higher than usual, on account of increased demand. Some of them are as follows: Oats, two cents; wheat, two cents; potatoes, three cents; cabbage, three cents; onions, five cents per pound. We sell everything here by the pound except eggs, which are forty cents per dozen now. Butter is thirty-five and fifty cents per pound. Gold has been discovered in the Big Horn Mountains in paying quantities. Last summer I went into the Mountains on a prospecting tour, and while there "panned out" twenty-one cents to the pan, but others found much better prospects—from thirty-five to seventy-five—which is good pay. We think there will be a good mining camp started this spring. The snow is very deep there now, in places ten or twelve feet.

Cattle and horses did well this winter. We feed more now than we used to, and find it is better to do so, as we get more calves. Cattle on the range do not increase more than sixty per cent, but where fed and sheltered the increase is often eighty-five and ninety-five per cent, and losses reduced to about one or two per cent.

E. B. CHAPLINE, Johnson Co., Wyoming.

Fruits in Dakota.

The native fruits and berries encourage us to hope that finer varieties will succeed here. Wild plums are plentiful. Strawberries, raspberries, gooseberries, and Juneberries are all found here, and it is only a question of time when other berries will be cultivated, for experiments are constantly being made. The experiment station recently established in our State will be of great assistance. The failures and successes in other places will be repeated here until we find just what our climate and soil are fitted for, and then possibly our fruits, like our vegetables, may be of superior quality.

COLIN C. THOMAS, Stutsman Co., North Dakota.

FARMING IN FOREIGN LANDS.

The value of honey imported into Great Britain last year from America amounted to $150,750.

The death is announced at Copenhagen of Prof. N. J. Fjord, a great authority on scientific dairy work.

According to a recent report sent to the Lower House, Prussia, there were 2,395 stallions in the State Stud, 570 of which were bred there.

The dairy associations of Schleswig-Holstein have become so popular that now there are 15,000 dairies conducted upon the association plan.

The largest reservoir or artificial tank in the world is at Dhetar, twenty miles southeast of Udaiaur, India. It covers an area of twenty-one square miles.

Prince Bismarck, who farms extensively at Varzin, is said to have cleared $10.000 from his cattle and geese last year, and his profit from yeast exceeded $30,000.

At the Sylvia Park stud sale, at Auckland, New Zealand, the racehorse Nordenfelt was sold for $42,000 to Mr. T. T. May, of Sydney. Mersey, the dam of Caroline, was sold for $1,575.

The sale is announced of the famous rough-coated St. Bernard dog, Sir Bedivere, in England, to Mr. E. B. Sears, of the Wyoming Kennels, Melrose, Mass., who has given $6,500 for him.

The customs of Adelaide, Australia, recently refused to allow 450 cases of lemons, brought by the steamer Oruba from Italy, to be landed on account of their being infected with scale.

An epidemic of "pink eye" has broken out at Sydney, New South Wales, and the City Omnibus Company have been compelled to reduce their service, 130 horses being stricken down. Several of the animals have died.

Stanley says that portions of Africa will always be worthless on account of ravages by grasshoppers. In one instance he saw a column of young grasshoppers, ten miles broad by thirty long, marching down a valley.

A commission has been formed under the direction of stud director Von Bonin for the opening of a stud book for pure half-breeds. The first volume will appear in 1897, but a book in pamphlet form will, however, be issued this year.

The Prefect of the Seine has formally decreed that the Champ de Mars in Paris shall be transformed into a park, in which all the exhibition buildings shall be preserved. The huge machine gallery is to be metamorphosed into a riding school.

The forests of Europe, according to a recent report of one of the State foresters of Prussia, cover the following areas: Germany, 34,596,000 acres; Russia, 494,228,600 acres; Austria-Hungary, 46,951,700 acres; Spain, 19,769,000 acres; Italy, 9,884,570 acres; and England, 2,471,000 acres.

A cross-bred ewe (Exmoor and Devon long wool), the property of Mr. Charles Norman, East Withey Farm, Winclescomb, England, is remarkably fecund. She has yeaned in seven consecutive years the large aggregate number of twenty-seven lambs, and brought them all up. This year the old ewe had four lambs.

The Dutch consul in London reports that the importation of Dutch cattle into Britain has gone down greatly since 1875, the United States, Canada and Australia being able to supply the markets to better advantage. The importation of sheep still is considerable, though the British imports of Dutch cheese have declined.

In Scotland, where wood pigeons were extremely rare at the end of last century, they now swarm to a most injurious extent. Congregating in countless flocks in the stubbles, they forage there until the grain is exhausted, when they attack the leaves of the young winter wheat, swede turnips and red clover, the latter, when not killed, often suffering severely from the ravages inflicted on it.

In England the magpies have developed a taste for live flesh. In Somersetshire, recently, it was found that driven by hunger during the severe weather magpies had resorted to tearing flesh from living cattle. One cow was found with a raw hole, the size of a goose egg, by the side of the root of the tail, and the birds had been industriously pecking holes in the flesh of other cows also.

The butter industry of New Zealand during the past three or four years has been steadily establishing itself. Several companies and combinations—to say nothing of numerous private people—have embarked a considerable amount of capital in the enterprise, and this season's output promises to be perhaps the very largest they have had. Hence there will be hundreds of tons of butter for export.

Great Britain received from Russia nearly 75,000,000 eggs last year. France and Germany between them sent over 714,000,000 of eggs, Belgium, over 200,000,000; Portugal, 2,000,000, and smaller quantities from Norway and Sweden, the Channel Islands, Morocco, Malta, Italy, Egypt, and Turkey. It seems that altogether the British go abroad for between 111,000,000 and 112,000,000 eggs, representing in value over $15,000,000.

The cotton worm has made its appearance in most of the provinces of Lower Egypt. It is reported from Ziftah, one of the principal towns in the cotton-growing district of Lower Egypt, that after two years of sickly existence the insect came out again with renewed vigor. In several plantations the amount of eggs laid by the moth is so overwhelming that all hands available have proved quite insufficient to destroy them.

The retail price of American hams in the Irish markets is twelve to fourteen cents a pound or about a third less than the local product demands. It is known, however, that one of the chief pork packing concerns of Limerick buys great quantities of American hams in the crude state, smokes them, impresses its own brands upon them and places them upon the market at a price only a trifle below what it asks and receives for its own goods.

Cardinal Lavigerie has founded a prize of $300 for a camel race, to be held annually at Biskra, in Algeria. The improvement of camel breeds, which the cardinal thus hopes to foster, is an important object in view of the anti-slavery crusade for which he has aroused such universal enthusiasm. The camel far better than a railway will enable France to make effective her authority over the Sahara desert, and as European fleets close the sea route to slave traders, so the camel cavalry will cut them off from the caravan routes across the desert to Tripoli.

The Australian farmer is also eagerly engaged in turning his attention to the cultivation of cotton, and every assistance is being given him by the Colonial authorities. Immense quantities of excellent cotton also grow wild in Africa, and the opening up of that continent to trade may result in the extension of its cultivation and export, placing it in formidable rivalry with both India and America. The cotton plant, moreover, is indigenous in many of the islands in the Pacific, where it produces a splendid staple. The trees attain a height of ten feet, and the bolls are as large as a turkey's egg.

The Hungarian government is trying a very interesting experiment in vine culture. As it has been found that the phylloxera does not attack vines growing in sandy soil, it has been decided to plant with vines the Delliblat sand region between Delliblat and the Danube, and to establish there 3,000 families of vine dressers. Huts will be erected for these colonists at government expense, and each family will receive about $50 for a year, until the vine products become remunerative. A railway will be constructed from the vineyards to Verschitz, where the cellars of the Delliblat wines are to be kept.

The total production of the barley in the world is estimated at 825,000,000 bushels. Of this amount Europe produces from 630,000,000 to 650,000,000; valued at $800,000,000. The following will show the average production for each country of the world: Algeria, 60,500,000 bushels; Austria-Hungary, 88,500,000; Belgium, 3,665,700; Bulgaria, 15,125,000; Canada, 19,250,000; Denmark, 20,650,000; Egypt, 27,500,000; British Isles, 90,750,000; France, 49,500,000; Germany, 93,500,000; Holland, 4,400,000; Norway and Sweden, 22,000,000; Roumania, 19,250,000; Russia, 129,250,000; Spain, 77,000,000; Turkey, 13,750,000, and the United States, 57,750,000 bushels.

The quantity of silk now lying unsold at Yokohama is put at thirty thousand bales; and what to do with this vast quantity is a question that is exercising the attention of business men and financiers generally. Several influential native newspapers advise that the stock be sold this year and not held over in hope of higher prices another season, which are by no means probable, and they condemn the Bank of Japan for advancing money at low interest to silk merchants in order to enable them to "hold" for a rise. Should things remain in their present state, it is apprehended that a panic will overtake the Japanese commercial world at the end of the year.

Spain is reported a good field for the introduction of farm machinery of American make; and such an attempt might tend to remove that depression in the farming interest which has caused so many Spanish farmers to emigrate to South America. Some tools from this country find their way there through English, French and German houses. In fact, the greater part of American goods sold in Spain pass through the hands of European merchants. And while the oysters of Baltimore and the salmon of the Pacific coast may be found there the prices at which they are sold are four times what they are with us. Pound cans of Chicago beef sell at forty cents. If a direct trade could be established between that country and our own, prices there would be lowered probably, and our exportations stimulated.

There are now in France about 560 agricultural co-operative associations, each of which has thousands of members. They buy manures, seeds, feeding stuffs, implements, and other farm requisites at the lowest wholesale prices, with guarantees as to quality, and supply the same to members without profit. They analyse some of these commodities to insure purity, and publish the standard of purity which they stipulate for in what they receive from manufacturers or merchants who send in tenders. Arrangements are also made for low rates on railways. Some of the associations are beginning to sell as well as to buy for their members. Prior to the commencement of this system of self-help, six years ago, the farmers were at the mercy of dealers and traders, and it is said were often shamefully victimized.

The importation of Siberian reindeer into Alaska is strongly urged. "This would be a great step forward in lifting the native races of that boreal region out of barbarism and starting them toward civilization, a step from the grade of wild hunter to the grade of herdsmen who live on domesticated cattle, and besides this furnish an article of exportation and commerce. The native tribes on the Siberian side are thriving with their herds of reindeer. It seems that all Northern Alaska is filled with moss meadows (tundra) which furnish the very food that the reindeer requires. Once started, the business would grow into large proportions, and the most serious problem that threatens Alaska will be solved." The United States Congress is asked to extend the agricultural college and experiment stations appropriation to Alaska for this purpose.

Unless something is done to keep down the multiplication of rats in the agricultural districts of England, these rodents will soon become as great a scourge to that country as the rabbits have become to New Zealand. Although thousands of rats were slaughtered in the Lincolnshire fens last winter, a considerable number escaped from the stackyards to the drain banks, which they have honeycombed in all directions. Now that the crops have been gathered, there is nothing for them to eat, and they are returning to the stackyards, where they burrow into the stacks and destroy quite as much grain as they eat. Where rat-killing was neglected the plague will be far greater this year than last. Rat-catchers are busily engaged all over the district, and in many instances receive six cents per head for every rat they kill. Farmers are trying all sorts of experiments, with the object of preventing the rats from reaching their stacks.

English farmers are complaining bitterly at the low prices of their produce compared with what they were fifteen years ago. Wheat and oats command but four-sevenths as much, barley but two-thirds, and other green crops about the same. The latter includes potatoes, which have fallen still more in value. Farmers say that if they can not afford to buy manure and grow grain they can not raise live-stock, hence the decrease in numbers of sheep in the past twenty years is estimated at over four millions; in pigs nearly as many, in cattle over ten millions; while there has been a gain in horses of about 100,000. The acreage in wheat, barley, and oats has fallen off an eighth in period named. The cause is attributed to the almost unlimited importation of both meats and grains as well from British dependencies as from America, and to the aim of the manufacturers to benefit themselves at the expense of the tillers of the soil.

SCIENCE IN FARMING.

A Farmer Professor.

Isaac Phillips Roberts, Professor of Agriculture in Cornell University, at Ithaca, N. Y., was born in Seneca County, New York, July 24, 1833. His early life was spent upon his father's farm, and at the age of twenty-one years he went to Indiana and became a Western farmer. In 1870 Mr. Roberts was elected Professor of Agriculture at the Iowa Agricultural College, which position he held until 1874, when he accepted a call to Cornell University to become its Professor of Agriculture. He still holds the last-named position with much credit to himself. Professor Roberts has been the Director of the Cornell University Experiment Station since its establishment and is likewise Dean of the College of Agriculture of the University. He is a prominent member of the leading national, State, and local associations devoted to agriculture and allied subjects, and is president of some of them at the present time. During his whole professional life he has been actively engaged in various branches of agriculture. He is now president of a land and live stock company engaged in feeding a thousand steers annually upon its own land in Mississippi. He is also the owner of a large farm in the South devoted to raising stock. These last facts serve to show that Prof. Roberts is a farmer first and always and practices what he preaches, doing both with success. He is remarkably successful as organizer, director, and teacher. His good work has been felt not only throughout his native State as lecturer at various farmers' meetings, but his welcome voice has been heard at many of the leading agricultural meetings throughout the Union. By his pen he almost weekly gives wide wings to his matured thought upon various timely farm topics. Among the characteristics that have helped him to win marked success are thorough sympathy with the farmers because one of them, and a keen insight into methods for applying science to farm life.

Gleanings from the Bulletins.

GEORGIA, No. 10, pages 24. In the experiments with the corn the results were that nitrogenous fertilizers increase the yield- the nitrate of soda is better than sulphate of ammonia; it is easy to apply too much nitrogen to corn; nitrogen in moderate quantity, with phosphoric acid and potash, is better than when used alone. Superphosphates do not give satisfactory results alone, and it does not pay to use potash alone. The succeeding grass crop was more luxuriant upon the plats where nitrogen was applied, suggesting that there was a considerable left in the soil. Intercultural fertilizing was tested, and the results indicate that one undivided application on or before the time of planting will give as large a yield as when divided into two or more portions. While this may be the rule when the amount is moderate (that is, less than five hundred pounds per acre) it may not be when larger quantities are employed. The tests with pulling corn fodder do not indicate that it is a profitable practice, although a time-honored one. Experiments were made upon deep versus shallow culture of corn, and the results show that there is a difference of 2.4 bushels in favor of the shallow culture, but the deep culture plats gave a slightly larger yield of fodder. In the tests upon corn at different distances it was found that with the hills two by five feet the yield was 32.7 bushels, while when four by five feet the result was 36.6 bushels per acre. The number of large ears was about the same in the two plats, but there were but few nubbins in the second plat. This result suggests that corn possibly is frequently planted too close for the best yield.

ILLINOIS—No. 13, pages 46. This large bulletin is full of results of field experiments with corn. This crop is very susceptible to climatic conditions. The yield of corn was least in the earliest and latest plantings, and the best in the intermediate plantings. It is, therefore, safest to plant a medium maturing variety any time in May. The shallow planting gives the greater yield; three inches gave the largest crop. In thickness of planting, for example, whether three grains every forty-two inches or one every fourteen inches did better it was determined that single kernels at short intervals give the best yield. There is a constant increase of stalks from the thick to the thin seeding. About one grain every twelve inches gives the best yield. It is more work to keep drilled corn clean of weeds. No important benefit is derived from cultivation after the ordinary time is past, and in all cases shallow is better than deep culture. The roots must not be injured. In the tests with various kinds of fertilizers it was found that the plats thus treated yielded during the three years a little less than the plats receiving no fertilizer of any kind.

KENTUCKY, No. 31, pages 28. This bulletin, which is fully illustrated, treats of some strawberry pests, and first of all the leaf-blight fungus. This is a very serious trouble, but from the tests made it is evident that it can be largely prevented by the use of the Bordeaux mixture and eau celeste, the former preferred. The Bordeaux should be applied as frequently as every fortnight. Twenty-two gallons of the mixture is enough for spraying for a whole season 337 feet of strawberry plants in rows, and will cost fifty-six cents. The removal of the blighted leaves without spraying will increase the injury from the fungus. The variety of strawberry has much to do with the amount of blight, as some sorts are nearly free, while others are badly infested. Among insects, the leaf roller is treated and its work illustrated. The remedy consists in mowing and burning over the bed, with the aid of a little straw, when the roller is in the leaves. October is the best time for this. A second pest is the crown borer. As the insect has no good wings it is slow in migration and, therefore, it is very important to select plants for new beds from places free from the pest. No practicable method of using insecticides has been found.

PROF. ISAAC P. ROBERTS.

Other strawberry pests are white grubs, June bugs, root worms, and several others, for all of which suggestions for treatment are offered. When the plants are in fruit it is not wise to employ any of the arsenic compounds.

MISSOURI—No. 13, pages 20. This is a report upon spraying for the codlin moth, apple scab and black rot of the grape, with full tabular reports upon tests of a large list of varieties of strawberries, raspberries, blackberries, tomatoes, peas and potatoes. It was noticed that when the apple trees were sprayed with London purple the leaves were slightly injured, but with Paris green no damage was done. The time for spraying for codlin moth is from the time the petals fall until the fruit hangs suspended. The Bordeaux mixture was employed with excellent effect for the apple scab, it being used in connection with the Paris green. Spraying with the Bordeaux mixture for the black rot of the grape did not produce much effect, as there was but little of the fungus elsewhere on account of the dry season.

MICHIGAN—No. 71, pages 12. This is a bulletin upon sugar beet culture in the United States. The requisite climate is pointed out, including temperature and rainfall. The crop needs a porous soil of good depth and drainage, and rich, plowed deep and then rolled. Plant the crop not later than May 15. Drill the seed one inch deep and roll the ground. Cultivate frequently, until the leaves cover the ground. For the present, we must depend upon France, Germany and Austria for our seed, but it is hoped that American-grown seed will be soon in the market.

NEW JERSEY, No. 75, pages 32. This is a record of experiments for 1890 upon insecticides and how to apply them. The life history of insects is pointed out and the reasons why the remedy must depend upon the nature and habits of the pests. Thus sucking insects, as plant lice, must be treated by poison that acts by contact like fish oil soap or kerosene emulsion, while insects that feed upon the surface can be reached by applying a poison to the infested plants. It is very important to begin the fight against insects early—as soon as possible after the insects are observed—for they are more easily killed when young. The insecticide should be applied thoroughly, that is evenly and with force enough to penetrate the crevices. A spray with a force pump is much better than a sprinkling. In the use of arsenites the addition of a little milk of lime avoids the liability to injure the foliage, especially of the peach. London purple may be used with the Bordeaux mixture, and the lime of the latter neutralizes the burning effect of the former. Potash salts are both fertilizers and insecticides. The peach louse, for example, working at the roots of seedlings, can be destroyed by using the potash salts and the trees fertilized at the same time. Tobacco is another insecticide that has such fertilizing power, and as such is worth several dollars per ton.

OHIO, No 9, pages 16. Two subjects are treated in this issue, namely, asparagus and transplanting onions. From the observations made there seems to be sufficient difference in productive capacity between male and female asparagus plants to justify a selection of the former. From fifty male plants the yield for a season was 610 ounces, and from the same number of females 407 ounces. The male plants can be obtained by division of old plants that it is found do not bear seed. The practicability of this result remains to be determined in actual practice. Rubber bands can be used economically in bunching asparagus, the time saved more than counterbalancing the extra expense, while the neater bunches handle and sell better. A large number of experiments were carried out in transplanting onions, and, with diagrams and engravings of groups of onions both transplanted and not, the subject is fully set forth. The results are somewhat surprising. Thus, transplanting increased the yield in some instances one hundred per cent and gave a large increase with all varieties. The best results were obtained with Pompeii Prizetake and White Victory. The transplanted onions were more uniform in size, as well as larger, and ripened from three to four weeks earlier than those grown from seed. The extra labor of transplanting is offset by the saving in weeding and, therefore, the increase of crop is an increase of profit. For transplanting, the seed is sown in boxes in the greenhouse, and the seedlings are set out by the middle of April.

PENNSYLVANIA, No. 13, pages 8. The black knot upon the plum is illustrated and described, and advice given as to its treatment. Every piece of stem or branch that is infested should be collected and burned. The rapidity with which this contagious trouble spreads is well established. Several pages of the bulletin are devoted to worthy ornamental plants that deserve acclimatization. Among those treated are a clematis from Thibet, tritoma from Cape of Good Hope, amaryllis from South America, aquilegia from the Rocky Mountains, evening primrose from Missouri and Texas, boeconia from China, arundo from Europe. The New England aster is one of our native perennials worthy of general cultivation. A full-page engraving is given of *Grevillia robusta*, or the silk oak of Australia. This is an ornamental plant that deserves much more attention than it has received.

SOUTH DAKOTA, No. 19, pages 28. The sugar beet is treated fully. In the sugar beet industry many details need to be looked after. Skilled labor, as well as expensive machinery, are needed. Small farmers with no capital cannot enter this work. But when the industry is once established, it will be of great benefit in the locality where the factory is placed. Stock raising will receive new life and diversified farming will be the order of the day. The station by soliciting co-operation, sending out seed, and in other ways is doing much to develop this industry.

The Best.—I have tried several farm papers, but I consider the AMERICAN AGRICULTURIST the best I have ever met with.

A. WILDSMITH, Santa Clara Co., Cal.

Fertilizers from the Slaughter House.—John Oberh, Carbon Co., Pa: Blood, offal, and broken or ground bones can be made into a convenient fertilizer by mixing them together with swamp muck, well aired, with sods, soils, or other absorbents. The mixture may be made into a heap in the field where it will be out of the way, and ready for use when needed. Do not mix wood ashes with the other, as it liberates the ammonia—itself a valuable fertilizer.

Freeing Beans from Weevils.—James M. Richards, Orange Co., N. Y.: The best method of freeing beans from weevils without spoiling their flavor is to take the mature beans as soon as they are picked and thrashed, and subject them to a temperature of 145° for one hour. This will not injure the beans for seed and will destroy the weevil in them. Another method is to add some bi-sulphide of carbon. This is the way seedsmen treat beans and peas, but for eating purposes we would prefer the first method.

Cutting a New Asparagus Bed.—Mrs. E. B. D., Kalkaska Co., Mich., asks "would it injure one-year-old asparagus roots set out last spring to be cut this year for two or three weeks?" They will not be as strong the next year as if left uncut.

Saltpeter for Squash Bugs.—E. E. Ludlow, Tompkins Co., N. Y., thinks it ought to be more generally known that a tablespoonful of saltpeter (nitrate of potash) dissolved in a pail of water, and a pint of the solution put around each hill of squashes will kill the striped squash beetles. He used it on his squashes last year, and found that it not only rid the plants of the bugs, but made them grow with great vigor. We are inclined to think that the latter is the great point. The nitrate is a powerful fertilizer, and the stronger the plants, and the more rapidly they grow the less will they suffer from the attacks of the beetles. It may be, too, that the sap and leaves contain so much nitrate that the beetles prefer to seek their food in some other squash patch. Dr. Wagner's experiments show that this explanation may be the true one. We would use the nitrate freely, either nitrate of soda or nitrate of potash, as most convenient, and in addition fight the bugs.

Wild Onions.—A. C. Bates, Park Co., Ind.: Your inquiry for some practical means of destroying wild onions in meadows and pastures is one that interests many of our readers who are not farmers, because these pestiferous weeds get into lawns, where they seem to defy all ordinary modes of destruction. Canada thistles can be killed out by constant cutting of the stems at the surface of the ground, but wild onions seem to multiply under this treatment, for they are now quite plentiful in a lawn which we have had cut with a lawnmower once a week during the past fifteen summers. The only way we know of getting rid of this pest is either to dig out the bulbs by hand or keep the land in constant cultivation until every seed and root is destroyed.

Milk Veins.—Jerome Aiken, Jewell Co., Kansas: The blood is sent out of the heart, which is a powerful pump. It passes through the lungs, where carbonic acid is exchanged for oxygen. There it changes color to a bright crimson. This bright colored blood is sent to every structure and tissue—bone, muscle, and skin—throughout every texture. It nourishes every part. This blood passes through the arteries. Every artery beats like the heart, and possesses a power to contract and force the blood onward. When an animal is cut in any part, and the bright red blood is thrown out by a pulsating motion, no matter if the stream is no larger than a needle, the blood is arterial. The veins bring back the dark blood from every part, and if they are cut the dark blood flows out without an impulse. The veins are of a softer structure than the arteries, and have valves or locks to let the blood flow in the direction of the heart. But veins, being vast and yielding, swell out in places so that they seem like little canals with many little basins, but the stream of black blood carries every drop from canal and basin to the heart. The right arm is stronger and larger because it has more exercise and receives more blood. So it is with a cow's udder. If the udder is more active, secreting a large quantity of milk, it is supplied with a proportionately larger amount of blood. The blood contains every element of repair and every element of animal product, so that as the arteries carry a large volume of blood, that same volume of blood must be returned from the udder back to the heart. Therefore, great milkers have a proportionate flow of venous blood from their udders. The veins of a large milker will have a greater show of tortuous veins. It is easy for an expert to judge of the relative milking value of every cow. To become expert a large number of cows must be examined.

Applying Fertilizers to Potatoes.—E. D. S., of New Hampshire, asks us how to apply nitrate of soda and other fertilizers to potatoes and adds: "We drop the potatoes in the furrow and cover with a plow. I use special potato fertilizer, strewing it on the side of the furrow, and then the plow does the mixing." This is a convenient way. If you wish to try nitrate, add one or two hundred pounds per acre to the fertilizer and apply in the same way.

Large Tomatoes.—A subscriber to the AMERICAN AGRICULTURIST says he wants to raise the largest tomato that can be grown, and asks what variety he should plant, and how manipulate the vines. "In the November number for last year," he writes, "you say, 'the largest tomato we grew this year weighed twenty-one and a half ounces.' You either do not know how to raise big tomatoes or do not know how to tell big stories." We do not aim to raise big tomatoes or tell big stories. Early planting, protection when needed, a sheltered situation facing the south, a dry, mellow soil, with a moderate dressing of well-rotted manure, superphosphate and nitrate of soda, and thinning the fruit, would be the best means we can suggest to raise large specimens. Our Southern friends, with their longer seasons, can probably grow larger tomatoes than we can. And when we hear of tomatoes weighing two and a half and three pounds they are probably grown South, or in a greenhouse. To raise the largest specimens possible we would try Potomac, or Henderson's No. 400, which latter may secure a $250 prize in addition.

When Dogs Stop Growing.—W. K. Peters, Pike Co., Pennsylvania, asks "at what period in a dog's age he stops growing." A dog does not stop growing until he has reached his maturity, which varies considerably with the size of the animal, and to some extent with the breed. Thus, the mastiff is barely full grown at two years, large hounds at a year and a half, greyhounds at the same time, pointers and setters from a year and a quarter to a year and a half, while terriers and small toy dogs reach maturity at a year old, or even earlier.

How Much Hay or Grass Will a Horse or Cow Eat?—Mrs. E. J. Johnston, Van Buren Co., Mich., asks: "How much hay will a horse or cow eat per day when little or no grain is fed. I can find no estimate in any farm paper, and no farmer can tell." That is strange. The general rule is that animals eat about three per cent of their live weight of hay per day or its equivalent. For instance, a horse weighing one thousand pounds would eat about thirty pounds of hay per day; and a cow weighing eight hundred pounds would eat twenty-four pounds per day, and a sheep weighing one hundred pounds would eat three pounds per day, and a hen weighing five pounds would eat about two and a half ounces of hay or its equivalent per day. It takes about one hundred pounds of grass to make thirty pounds of hay, so that a horse of one thousand pounds weight would eat one hundred pounds of grass per day. In fact, he will eat more than this because the green grass is more digestible than the hay. The advantage of feeding part grain and part hay is that the grain is less bulky in proportion to nutriment than the hay, and more easily digestible. The horse or cow can eat more and be capable of doing more work or giving more milk. Another important deduction from these briefly stated facts is that we should make a great effort to grow rich, nutritious grass, and rich, nutritious corn fodder, rather than a large crop of unnutritious, bulky food. The AMERICAN AGRICULTURIST was the first agricultural paper in the world to call repeated attention to these important and fundamental principles which lie at the basis of successful and economical feeding of farm animals.

Tripe.—B. Goodwin, Charlevoix Co., Mich.: Tripe is the thoroughly cleaned large stomach of beef cattle. To prepare tripe for the table, scrape and wash it the day before cooking. This should be thoroughly done by using several washings. Then boil in salt and water until it is tender; let it drain on an inclined platter during the night, and next morning cut into pieces three inches square, roll in flour and fry in hot lard or pork gravy. Serve with a gravy made brown, of the gravy the tripe is fried in and butter. Baked potatoes, fried apples, and stewed tomatoes, poured over small pieces of buttered toast bread, should be served with it for breakfast. The tripe may be fried in nice batter. To make "extraordinary" stewed tripe sprinkle grated cheese over the tripe before stewing. This may also be done before frying tripe. Digestible old cheese is too sparingly used in American cookery.

Religion in the Garden.—An esteemed subscriber in Corwallis, Mont., writes us: "I am not a farmer now, but cannot do without the AMERICAN AGRICULTURIST. It has helped me always to raise vegetables in my garden, fatten my pigs and chickens, and has given practical and valuable hints for indoors. I have brought up five children. My daughters are married and are excellent housekeepers, and industrious, neat, economical wives and mothers. The sons are splendid business men. I am convinced that much of their success is due to sound religious teaching combined with good wholesome reading, and the care of the garden, farm animals, making butter, attending to the calves, etc. These add much to the enjoyment of life and the social world, and prevent people from getting so ethereal in their make-up as to forget that they are in the same environments with other mortals. We all like the AMERICAN AGRICULTURIST."

Johnson Grass in California.—John S. Dore, Fresno Co., Cal., is not very favorably impressed with this forage crop which has proved so valuable in our Southern States. Johnson grass, or evergreen millet, as it is sometimes called, he writes us is regarded as the worst pest in the shape of a weed that annoys the farmer in Fresno county. It was introduced as a valuable fodder plant, but it grows so rank and coarse it's of no value here, and once in the soil it is worse than Canada thistles to exterminate. The roots will go down in this soft irrigated soil of the San Joaquin valley to the depth of five and six feet, and completely fill the ground with its roots. It's a mighty good farmer that can get rid of Johnson grass once it gets on his land.

Cedar Oil.—R. J. D., Litchfield Co., Conn.: This is obtained by macerating the fresh tops of the red cedar (*Juniperus Virginiana*) in hot water and distilling the fluid. It is used as a substitute for savin oil. It is an external irritant, and is used in small quantities to give a peculiar odor to colognes. It is applied to blistered surfaces to keep up a discharge, and has also been used externally and internally in rheumatism. But savin oil is far more valuable as an internal remedy. It is too dangerous, however, for unprofessional use. It is often added to ointment or cerate of offensive odor to cover it up.

Mildew in Grapes.—M. N. McNeil, Shelby Co., Ohio: This disease is caused by a parasitic fungus. There are two kinds of grape mildew—one known as the downy and the other as the powdery mildew. The one referred to is probably the former. The disease may be prevented, or at least reduced to almost nothing, by closely adhering to the following directions: Take copper carbonate, three ounces; strong ammonia, one quart; water, twenty-two gallons. Dissolve the copper carbonate and ammonia in the water and use as a spray. All green parts of the vine should have a thorough application of this solution before the mildew has appeared, or just as soon as the berries are set. There should be six or seven sprayings after this, from ten to fifteen days apart. These means are preventive, and it is unwise to wait until the disease appears before applying the mix-

ture. The powdery mildew causes more damage in certain parts of the South and along the Pacific coast than elsewhere. It readily succumbs to sulphur either in the form of flowers of sulphur or solutions of the sulphide. In applying sulphur, bellows should be used, and the first applications should be made ten or twelve days before the flowers open, the second when in full bloom, and a third three or four weeks later if the disease seems to be on the increase. The best results are obtained when the applications are made with the thermometer ranging from 80° to 100°. In this temperature fumes are given off which quickly destroy the fungus.

Apples for Milch Cows.—G. H. Herrick, Worcester Co., Mass., asks: "Will feeding apples dry up a cow?" It is remembered when it was common to denounce the feeding of oats to milch cows lest it would dry up the milk. Chemistry has settled this doubt, added to common sense. There is much excellent nutriment in apples. But alone, apples are not a perfect food. Therefore, apples should be fed with meals, hay, and grain. Apples will produce a plentiful supply of thin milk, but being deficient in fat require albuminoids and fats or starch to make rich milk and much butter. Apples, cooked and raw, are an excellent adjunct to cattle foods and fodders. There is nothing so greedily sought for as apples by milch cows. As in the human subject so in animals, whatever is grateful to the taste is generally healthful and desirable food. Persons, especially young ones, thrive on apples, pears, peaches, grapes, and other fruits. Fruit is both grateful and healthful. Cooked apples with wheat-bran slop is a special stimulant to the flow of milk. To this add a handful of flaxseed meal and one of pea-meal, and good rich milk and fine flavored butter will be sure to be produced. Cows unaccustomed to apples if fed too freely, especially if the apples are very sour, might have colic. Cooked corn meal, ground oats and apples make a most admirable ration for milk and butter, and health. Too few roots and too few apples are fed to cows.

Good Use for an Old Mower.—John Yates, Tioga Co., N. Y., writes, that having bought a new mowing machine, the question occurred how best to utilize the old one, which he solved in the following manner: "I took the mower all apart, merely leaving the two large wheels, with the crossbar which connects them, and the tongue, and then, with the aid of the oak frame of an old roller that had been stored for years, and was as hard and strong as iron, and ten bolts, I constructed a small frame that fitted in between the wheels, securely fastening the tongue to this, and raising the frame with short cross pieces, until a bolster could be fitted across the top, so as to project out each side over the wheels. I cut out places in the bolster so that the wheels could revolve beneath it without touching. When it was completed, it made a strong, durable, two-wheeled truck, on which my son drew logs all the fall to the sawmill, a short distance away. A special advantage in its favor is that it is so much easier to load than the regular truck, being lower. Several of my neighbors pronounce it quite a success, and it has cost nothing but the bolts and the time in constructing it."

Shorthorn Cattle.—T. F., Franklin Co., Mass.: The milking strains of Shorthorns are not strictly confined to any one of the various families of that valuable breed. In fact, most of the Shorthorn cows of the English and Scotch dairies are without recorded pedigrees, though well-bred. It is a notable fact that light yellowish red and roan are their characteristic colors. The principal branches of Shorthorns are the Bates, which originated with Thomas Bates, of Kirkleavington, England; the Booth, which have been bred by Thomas Booth and three successive generations of his descendants, principally at Warlaby, England; and the Cruickshank, which originated some forty years ago with Thomas Cruickshank, of Littyton, Aberdeenshire, Scotland. The Bates Shorthorns—which include the popular "Duchess" family—are noted for the fine muzzles, elastic skin, general blockiness of form, and the stately arched crests of the bulls. The Booth Shorthorns have less silky hides; more light colors are found among them, and this branch of the breed doubtless furnished the greater proportion of the milking strains. The Cruickshank and other Scotch Shorthorns were bred mainly from the Booth strains, and are now extremely popular in England and in the western parts of the United States. Shorthorns are by no means "going out of use" in this country. On the contrary they are more numerous than ever before. But the increase of other breeds has divided the public interest. They are less used for milking than formerly, because it is found more profitable to keep special dairy breeds for this purpose, and to breed Shorthorns and other easily-fattened breeds for beef rather than aim for "general-purpose" cattle.

Wheat on Limed Soil.—Simon J. Lichty, Somerset Co., Pa., says he uses from 100 to 300 bushels per acre of slaked lime for wheat. "We can raise," he writes, "enough of straw, but no wheat as in other places. If we get twenty-five to thirty bushels per acre, we call it extra. We have tried phosphates, but got no benefit. Would nitrate of soda help us?" If you get straw enough, we do not know of anything that will help you. After all, twenty-five to thirty bushels per acre is not bad. Try 150 pounds of phosphates per acre at the time the wheat is sown in the fall, and a topdressing of 150 pounds of nitrate of soda early in the spring. Lime furnishes nitrates by assisting in the nitrification of organic matter in the soil. But the change does not take place till warm weather, and this may be one reason why it produces too much straw. As a rule, however, lime gives nice, bright straw and well filled ears.

The Horse-Power of Waterfalls.—L. Robinson, Green Co., O.: The unit of work is the foot-pound, which is the mechanical value of a force capable of raising one pound through one foot of vertical space. Thus the force required to raise a ten-pound weight through one foot is ten foot-pounds. The same weight raised ten feet would be a hundred foot-pounds. The number of foot-pounds it is seen is found by multiplying the weight of the body in pounds by the distance in feet through which it is raised. A horse-power is 33,000 foot-pounds per minute. Flowing water acts as a moving power by its weight and the force of the current. Find the amount of water falling per minute by multiplying the area of the cross section of the stream in feet by the velocity in feet per second. This will give the cubic feet flowing per minute. Reduce the cubic feet to pounds by multiplying by sixty-two and a half the number of pounds in a cubic foot. This product multiplied by the fall in feet and divided by 33,000 gives the number of horse-power of the running stream.

New Zealand Spinach in Florida.—J. O. B., Lake Co., Fla., writes us that after a trial of three years he most earnestly advises all lovers of "greens" in Florida to grow New Zealand spinach. It is of luxurious growth, has a fine flavor, and stands the Southern climate well. It seeds itself and may be had any month in the year.

To Prevent Potatoes from Sprouting.—A. C. Keyes, Linn Co., Iowa: The best way to prevent potatoes from sprouting is to keep them dry, and as cool as possible without actually freezing. Nevertheless, if sprouts appear, they should be rubbed off.

Calystegia pubescens.—M. N. Y., Hamden, Conn., wishes to know if this plant could be grown in large pots or tubs. Yes, we should think it would succeed well in tubs and make a fine climbing plant. In fact, this method of growing them would have this advantage over planting them in the open ground in that they would not run over the entire land and become troublesome.

Soot and Lampblack for Manure.—D. G. Stone, Marquette Co., Mich., asks for information in regard to the value of soot and lampblack as a fertilizer. Soot from bituminous or soft coal has been used as a manure for many years—certainly for over a century—and, notwithstanding the introduction of modern fertilizers, it still holds its ground. In England, especially, it is carefully saved and used extensively as a topdressing for wheat, hops, etc. It sells for about ten cents a bushel. Its value as plant food consists principally in the sulphate of ammonia which it contains. This varies considerably. As a rule, the better the coal the poorer the soot. The ammonia and sulphuric acid are produced by the combustion of the nitrogenous organic matter and the sulphur in the coal, and condense on the chimney in the form of sulphate of ammonia. On the average, a ton of soot from soft coal contains about 250 pounds of sulphate of ammonia, one of the most valuable and costly ingredients of commercial fertilizers, costing about three and a half cents per pound. This would make soot worth $8.75 per ton. The soot from wood contains about half as much nitrogen or potential ammonia, as soot from soft coal. But it is not worth quite half as much because the nitrogen is not in as an available condition as that in the sulphate of ammonia in the soft coal. In regard to lampblack, we do not know its average composition. Some kinds, like German or Frankfort lampblack, which is said to be made from grape lees, peach pits, and bone shavings, might contain a high percentage of nitrogen, while other kinds might contain very little. So far as actual plant food is concerned, the value of soot and lampblack depends entirely on the nitrogen or ammonia it contains. But farmers use it for killing wire worms as well as for manure, and gardeners find it exceedingly useful not only for its fertilizing effects but for driving away "Jumping Jack" from cabbages, turnips, radishes, etc., when dusted on the plants when the dew is on. In rather coarse, sandy soil the fine, dark charcoal flour not only attracts heat but fills up the pores between the particles of sand, and enables the soil to hold more moisture.

Use for Old Fruit Cans.—William Holt, of New Brunswick, writes us: "Three years I found my young apple trees badly infested with borers. After cutting these out, I gathered all the old cans I could get, took out the bottom and cut open the sides so as to spring them open and inclose the trees. In some cases I had to use two cans for one tree. Then I filled the space between the can and the tree with soil. Now the trees are all healed, and none of the trees have been infested since. When the soil washes out I replace it occasionally.

Elephant Apples.—Miss L. H., Brooklyn, N. Y.: The "elephant apple," mentioned by your friend and correspondent in Burmah, is the fruit of the *Feronia elephantum*, a small tree of the orange family, and it is more or less common throughout India and Ceylon as well as in Burmah. The fruit is about the size of an orange but with a very hard woody rind, containing many seeds imbedded in pulp of a delicious fragrance, but not very agreeable in taste. The fruit is valued for its medicinal properties only.

Trees for Kansas.—F. G. Bursch, Lincoln Co., Kan.: If you desire rapid growing trees for planting on your timber claim take silver maples, catalpa and cottonwoods. These can be obtained at the nurseries at a very low rate by the thousand. But if cheapness and rapid growth are not essential conditions, plant sugar maples, white ash and white oak, with a few rows of American arbor vitæ and spruces as a windbreak in winter.

Agricultural Ants.—T. D., Boston, Mass.: The simple, and probably local, name "red agricultural ant" is scarcely distinctive enough to enable us to determine the species, but if it refers to species of ants that attack the growing crop, then they are probably of the genus *Œcodoma*, to which belong several species of what is called "leaf-eating ants." They are very destructive to fruit and other trees, shrubs, and plants throughout semi-tropical and tropical America, and long considered a veritable scourge to agriculture in those countries. We have no doubt that spraying the plants with some poisonous or offensive solution would either kill or drive these pests away. Their large and conspicuous nests are also readily destroyed by fire, poisonous liquids, and in other ways, but it is rarely attempted, owing to the natural indolence of the native people of warm climates.

Watermelons.—H. T. Stevens, Wayne Co., N. Y.: For watermelons the ground should be made rich and mellow as a garden. Cultivate early and thoroughly. They should be planted in light dry soil. Dig out a large hill, fill with good horse manure, cover with soil, plant, and sprinkle with water that has two pounds of Peruvian guano to the pound, this will give them a vigorous early growth which will cheat the bugs. Plant ten feet apart and pinch the most vigorous vines. Surround each hill with a box or cheese hoop. It is cheaper than to fight cut-worms and bugs. Do not be afraid of the quantity of manure, or of the pinching back.

AMERICAN AGRICULTURIST
FOUNDED IN 1842

MAY, 1891.

ISSUES OF THE DAY.

The Farmer in the Impending Change

C. WOOD DAVIS.

At the close of the seventh decade (1870) the agricultural populations of the temperate zones were prosperous. Wherever they owned the land they cultivated they were exceptionally well off. But with the advent of the eighth decade conditions were inaugurated that have produced a change that has been as widespread as it has been disastrous to the cultivator. While it has lessened the price of staple food products the world over, it is more than questionable if this change, so disastrous to the agricultural interest, has benefited the artisan and laborer. It has enabled them to buy their food for less money, yet probably such food has, because of this change, actually cost them more labor than it would had prices remained quite as high as they were during the first half of the eighth decade. This is because the changed conditions surrounding the employment of the capital and labor of the agriculturist have, in a very great measure, destroyed the purchasing power of the best and most numerous class of customers in town and village.

The population in the United States directly dependent upon the returns from agricultural labor for the means of subsistence numbers some 25,000,000, and is 40 per cent of the entire population. Now when, from any cause, the purchasing power of two-fifths of the people has been destroyed it means lessened employment for others, lower wages, and a lessened purchasing power on the part of all the industrial classes, with more or less commercial stagnation, hard times and an increase of indebtedness on the part of that body of producers whose wares are selling at or below the cost of production. That this has for years been the case with the great body of American cultivators admits of no question. But one result could possibly follow, and that we see in the lessened purchasing power of this great body, which clearly results in lessening the purchasing power of all the other industrial classes. Take one-fourth to two-fifths from the returns of any considerable body of people and you will almost wholly destroy their power to purchase the products of the labor of others. This is just what has been done in the case of the American farmer—and for that matter all the farmers of the temperate zones. His entire income has been—taking the class as a whole—no more than sufficient to pay taxes, interest and provide a bare subsistence for his family. The result is that he wears last year's coat, buys no hardware, builds few or no houses or barns, makes his old buggy answer another year, and the daughter has to do without the promised musical instrument, the son cannot secure the education expected, and the makers of hardware, coats, books, pictures, organs, pianos, furniture, carriages, teachers, transporters, merchants, jewelers and professional men are but half employed, and find it more difficult to buy flour made from seventy-five cent wheat than they would if wheat had never sold for less than $1.50.

THE REAL DIFFICULTY.

This state of affairs, however, under the conditions which have existed in this country, has been inevitable. It is not due to too much or too little currency; too much or too little protection; too much or too little free trade, or to the unreasonable exactions of the great transportation lines or yet to the baleful and far-reaching practices of the board of trade gambler in farm products, although the causes named may and in some cases certainly have been auxiliary.

The primary and potent cause lies deep down in that desire of the race to own a home and to sit each man under his own vine and fig tree, which has found such wide scope for its realization on the public domain where all were welcome to a farm without money or price. The result has been that, in the absence of a retarding forest growth, the *cultivated area* of the United States, in the fourteen years ending in 1885, *increased* 112 *per cent*, while *population increased but forty-four per cent.*

Since 1885, however, a change, and a far-reaching one, has obtained; obtained because the raw material from which farms are made has been practically exhausted. While the population continues to increase nearly in the same ratio that prevailed prior to 1885—or 12½ per cent during the last five years—the cultivated area has increased but seven per cent. The rate of such increase is yearly and progressively lessening. One consequence is that the quantity of land in cultivation, the product of which is necessarily marketed abroad, has shrunken from 21,000,000 acres in 1885 to 13,500,000 in 1890.

The following table shows the progress of American agricultural development during the last twenty years, and offers, in the progressively decreasing rate at which additions are being made to the cultivated area, the best possible assurance of the early coming of that time when the farmer will be the most prosperous member of the community:

Year.	*Cultivated area in staple crops.*	*Increase of cultivated area in each period and rate per cent of increase.*		*Increase of cultivated area each year during each period, and ye'rly per cent of in'cr'se*	
	Acres.	*Acres.*	*Rate per cent.*	*Acres.*	*Rate per cent.*
1871	93,000,000	.....	.....	.....	.....
1875	123,000,000	30,000,000	‡32.2	7,500,000	8.1
1880	165,000,000	‡42,000,000	**34.1**	8,240,000	6.8
1885	197,000,000	32,000,000	**19.4**	6,400,000	3.9
1890	211,000,000	‡14,000,000	‡ **7.1**	2,800,000	1.4

‡Note rapid diminution in aggregates of such increase and in the rate per cent.

GOOD TIMES SURELY COMING.

Concurrently with the opening of so many new farms in the United States, the export duty on wheat was abrogated by the government of British India (1873) and Indian exports that aggregated but 464,000 bushels in 1871 had sixteen years later risen to 41,500,000 bushels, without any increase, however, of the Indian wheat area. Indeed, the area sown to wheat in India at the close of the ninth decade was quite one million acres less than twenty years earlier. The augmented exports were wholly due to the increasing poverty of the Indian cultivator, who has been obliged to sell an ever increasing proportion of his crop to pay the constantly augmenting land (rent) tax, although the population of India is increasing about three times as fast as the cultivated area.

The result of such a disproportionate increase of population and cultivated acreage in the United States, and the *compulsory exports of wheat by the starving ryots of India* is seen in the fact that whereas during the five years ending with 1875 the average price, in gold, of English grown wheat, in the markets of Great Britain, was $1.64 per bushel, it was but ninety-five cents per bushel during the five years ending with 1889. In other words, wheat—which is the key to the agricultural situation—during this fifteen years shrunk in selling price, in consequence of the opening of too many American farms and the development of Indian exports, no less than sixty-nine cents per bushel, or forty-two per cent. All the other products of the farm have shrunken in the same proportion and it is no wonder that times should be hard, money scarce, and stagnation everywhere when the fountain has been dried at its source. Add *forty-two per cent* to the purchasing power of the farmer and every artisan, laborer, miner, manufacturer, merchant, transporter, builder and professional man will be fully employed, wages good, and the whole industrial life quickened in an astonishing manner. It is next to impossible to conceive the immense and salutary effect that the addition of even twenty-five per cent to the purchasing power of the great agricultural body would have upon the industrial and commercial interests of the nation. Yet it is about as impossible to conceive such a change as is impending, after the gloomy years which have passed so recently, and where the farmer has seen, notwithstanding all his industry and privation, the debt with its annual interest charge increasing. That such a change is impending is just as easily susceptible of proof as is the cause of the present depression, when we divest our minds of the fallacies which the political editor has forced upon us in and out of season.

PROOF OF THE IMPENDING CHANGE.

Data exists and but requires the labor and patience necessary to its gathering and tabulation to show that there is a most direct relationship between population, acreage in staple food products, prices for such products and the prosperity of the cultivator as well as the prosperity of all other classes. For there can be no doubt that all the industrial forces are just as dependent upon and just as intimately connected with the prosperity of the basic industry as in that remote past when the founder of the second great Persian monarchy said: "There can be no power without an army; no army without money, and no money without a prosperous agriculture." In the view of this most successful statesman, the farmer was the ultimate source of all wealth as well as power.

Many things have changed since the days of Artaxerxes and industrial processes differ wonderfully, but the great underlying principles have not changed. When the basic industry is in an unprosperous condition, there will be little money moving quickly through the great arteries of industrial and commercial life, and the body-politic will be in just the state that we have seen since the opening of two and a half farms where the increase of population required but one.

Now, however, a change is impending; or rather it is already here. The condition of the farmer will change for the better even more rapidly than his affairs changed for the worse during the eighth and ninth decades.

As has been stated, wheat is the key to the agricultural situation. This arises from the fact that it is the one great food staple that the nations of Western and Southern Europe import in large quantity, as it is the one which the nations producing more food than is required for domestic consumption have always been able to find a market for at some price, while it bears transportation and storage with less deterioration than most other food products. Hence, a very great proportion of the surplus acreage of the food exporting nations is, when suited to wheat growing, devoted to the production of that grain. This is no less true of Russia than of Australasia; no less true of the United States than of India. The result is that of the 13,500,000 acres now employed by our people in the production of food for exportation, between eight and nine million thereof is devoted to wheat growing.

During the eighth decade the wheat acreage of the world increased 22,500,000 acres. If we regard the compulsory exports of India as being equivalent to an addition of acreage, the addition to the supplies of the bread-eating populations of European blood was, during that decade, equal to the product of 24,000,000 acres. This additional area, at the ascertained average yield per acre, would give a yearly out-turn of 280,000,000 bushels which, at 4.5 bushels per capita, was equal to the requirements of 62,000,000 people. Yet such bread-eating populations increased not more than 38,000,000. Therefore, had rye kept pace with the increase of the rye consuming part of the bread-eating world there would have been at the end of the eighth decade a surplus wheat acreage equal to the support of some 24,000,000 people. This will be found to have been the situation when we analyze the relative increase of the wheat fields and population during the ninth decade.

Assuming that the wheat acreage twenty years since (when prices were good) was sufficient to meet the requirements of the existing population, then at the close of the eighth decade the acreage was some 9,000,000 acres in excess of requirements. During the ninth decade, there was added not to exceed 4,500,000 acres, or an area equal to the requirements of 12,000,000 people. This added to the 24,000,000, which the surplus at the beginning of the ninth decade would supply, gives us at the end of the ninth decade a supply sufficient for only 36,000,000 out of the 42,000,000 that have been added to the bread-eating populations of European blood during the ninth decade; the residue being supplied from the enormous reserves that were stored in mill, warehouse and farm granary during the existence of a surplus acreage, but which are now quite exhausted.

THE GREAT WHEAT SHORTAGE.

From the best data obtainable it would appear that with an average yield the world's crop of

wheat and rye is now 70,000,000 bushels *less* than the yearly consumption. Each passing year, by reason of the increase in the population, adds at least 25,000,000 bushels to this yearly deficit, so that by 1895 it can hardly be less than 200,000,000, if the per capita requirements remain as large as they have been. Up to this time, the reserves accumulated during the existence of the surplus acreage added in the eighth decade have sufficed to meet this deficit, but there are indications in every grain growing country that these reserves are everywhere nearly or quite exhausted. The injury already sustained by the growing European crop renders it absolutely certain that the coming cereal year will dispose of the last vestige of such reserves.

Moreover, the people of Europe consume yearly about 3.7 bushels of rye per capita, and as no additions have been made to the rye fields of the world during the ninth decade, there is an additional draft of something near or quite ten million bushels with each recurring year to meet this demand, created by the failure of the rye fields to expand as the population has increased. This has already consumed much of the surplus wheat. Hence, it is quite safe to say that the yearly additions to the bread-eating populations of European blood are such as to require an addition yearly to the wheat and rye supply of the world of from 30,000,000 to 32,000,000 bushels, or the product of 2,500,000 to 2,700,000 acres. Yet the entire wheat and rye growing world has, of recent years, been adding not to exceed 400,000 acres per annum, or less than one-sixth of the increased requirements. Moreover, there is no country where the present rate of increase is likely to be much accelerated at an early day.

Investigations undertaken more than a year since for the purpose of determining from official data the relative increase during the last twenty years of population and the acreage in each and all of the staple food crops of the grain growing countries have progressed so far that the data is at hand for the area producing ninety-five per cent of such staples. It shows that all increase of the two principal bread-making grains has ceased in Europe as a whole; has ceased in the United States, and among the exporting countries is increasing only in Australasia, Manitoba and Argentina, and that even in these countries it is doubtful if it keeps pace with the increase of domestic requirements in more than one. The other staples show a somewhat greater relative increase, but taking all kinds of grain and potatoes they are increasing—over the whole area included in these investigations—not one-fourth as fast as the consuming population.

POPULATION EXCEEDING PRODUCTION.

The cultivated acreage in the United States increasing of late but one-half as fast as the requirements for domestic consumption, we are yearly making enormous inroads upon the acreage heretofore employed in producing the grain and animal products sent abroad. While we now export—exclusive of cotton—less than six per cent of the products of our farms, this percentage must, from the increasing needs at home, shrink more than one-sixth per year, or we must lower the standard of living. This last we are not likely to do at an early day, even if it costs more for food, as the impetus given to all industries by the increase of the purchasing power of the farmer will for years at least keep every one busy in providing the things that he wishes to buy but cannot now because his products have of late years sold at or below cost.

Computations based upon the amount of the staples produced and the exports thereof during the last ten years show that each unit of our population has during the last decade annually consumed the product of 0.48 of an acre of wheat; 1.19 acres of corn; 0.39 of an acre of oats; 0.64 of an acre of hay; 0.11 of an acre of cotton, and 0.15 of an acre in barley, buckwheat, rye, potatoes and tobacco. Thus, 2.96 acres per capita of the great farm staples has been required for domestic consumption. If we assume that the world will have to take our cotton (during the next decade) at any price we may put upon it, then we shall continue to require 3.16 acres per capita until such time as a redundant population forces us to reduce the standard of living. As we cannot possibly have more than 220,000,000 acres in staple crops in 1895, owing to the practical exhaustion of the tillable portion of the public domain, we may safely conclude that we shall cease to export food five years hence. Then the world will, with average yields from the area in cultivation, be yearly short from 150,000,000 to 200,000,000 bushels of wheat and rye, and immense quantities of other staples. This means very high prices for farm products.

HIGHER PRICES SURE FOR FARM PRODUCE.

High prices for such products means that the farmer will not then be under the necessity of working an average of fourteen hours per day, that his children will be educated at the best schools, will read more and to better purpose, and that he will again take his rightful place in the world and receive his share of the good things of life. He will build better houses, barns and granaries; his land will rapidly double, treble and quadruple in value. Being able to secure what money is absolutely needful from the sale of a part of his produce, he will not be forced to sell it just when all his neighbors are forced to do the same thing, so that prices will not only be better, but will be far steadier and will fluctuate only as affected by legitimate supply and demand. Now, on the contrary, prices are affected by the farmers' poverty, which forces him to market his products just when every one else is doing the same thing. This results in glutted markets, and low prices, which once down are hard to elevate.

This period of high prices for farm products means a profound change in all our political, industrial and financial relations. The farmer will soon cease to be a borrower and will become a lender. This will necessarily cause a lowering of interest rates. The West will continue to produce an immense surplus of the food staples, which the East must have, and as the East can no longer credit the cost of this food at a low price on a high interest account, great sums will yearly move permanently from the East to the West, and this will soon result in converting the West from the debtor to the creditor section.

LEGISLATION OF TEMPORARY BENEFIT.

Results so desirable to the farmer will come not by reason of legislation, nor because of the domination of this party or that, or of one policy or another, but because the consuming element has more than caught up with that enormous development of agricultural lands that to the thoughtless seemed to make good the boast that we could feed the world.

As too great an acreage in staple food crops has caused the depression now happily passing away, an acreage so small as to insure a keen demand for all the farmer produces will bring higher prices than any of us can remember.

Unless the farmer can better his condition by procuring such legislation as will tax the vender of bogus lard and butter, as well as the pernicious option dealer, out of existence and put a stop to the evil practices of railway managers, there would seem to be little to do but go on raising the best crops that changing meteorological conditions will permit, selling them for the best price that is obtainable and wait for the good time so near, and that is as certain to come as that two and two make four.

Some Causes of Hard Times.

J. J. NEW, INDIANA.

The farmer is seeing hard times, but what is the remedy? Is it to sit down and talk politics, curse monopolies, grumble at trusts and ask for impossible legislation? Three-fourths of our farmers by their own acts increase their expenses unnecessarily. They buy what they do not need, and in many cases take no care of what they do buy. New machinery and tools are purchased when the old if repaired properly would do good service for years and the interest on the money paid for new would keep them up. Thousands of dollars are thus squandered every year and we complain of hard times. Of course, first-class tools are essential to good farming. But another essential is to keep them in repair.

Our farmers are in many cases trying to reach a twelve-foot persimmon with an eight-foot pole. Many of the older farmers are in easy circumstances and have acquired small fortunes. They live well, spend money freely, and can afford it. But for the small farmer who is in debt or is just starting out to undertake to follow in the footsteps of the man who has already twenty, thirty, or forty years the start of him is folly and the result ruin.

A comfortable home is one of the greatest blessings. But we can be comfortably situated without many of the costly luxuries that our retired neighbors can afford. A man can do very good farming with a draught horse. It is not essential for a farm team to trot a mile inside of three minutes. It costs more to train a fast horse than to run a five-hundred acre farm. Only men that have money to spend can afford it. Our greatest drawback is that we live too fast. There are always two ends to a procession and we cannot all head it. The cry is farming does not pay; farming pays better than trying to imitate some rich capitalist. The idea has become prevalent that we might as well be out of the world as out of the fashion. This rule may apply to the society man who spends his money at fashionable watering places in summer and in Washington during the winter. But it is ruin to the farmer of small means. Worst of all we patronize too many humbugs, and are made victims of sharpers whose only aim is to live without work. Too many of us are anxious to get something for nothing. It requires economy, patience, perseverance, and toil to make the farm pay. But if we devote one-half our time to politics and divide the other half between work on the farm and trying to get suddenly rich by questionable methods, then "farming won't pay."

The New Movement for Better Roads.

ANDREW D. WHITE.

The leading American railways have now become the best in the world; but our roads, as a whole, throughout the entire country are the worst in Christendom. As a matter of fact, in the majority of our States, so far as road construction and maintenance are concerned we are simply in barbarism.

Take the States of New York and Pennsylvania. Their roads are so bad that practically, during some seasons of the year, farmers are cut off from the market and from each other. So great is this evil that the governors of these States have recently called public attention to it. Those of us who live in this region know too well the reason for this. For a long time past there has been a way of making and maintaining roads among us which is simply an example of "how not to do it."

Now take the relation of the farmers to this question in this State of New York. For about seventy years they have been taxed to destroy the advantages of their own geographical position; and the result is that it has frequently been easier to get a load of produce from a farm in the far West to the seaboard than from a farm in the heart of the State of New York to the town nearest it on the canal or railway.

I find no fault with the policy of the State in building and fostering this great canal system, but the point is that we have neglected to do another thing which ought to have been done at the same time; we have not kept up our lines of interior communication. While we have enabled the farmers of the West to get easily to market, we have not enabled our own farmers to do so. [The same lack of good roads is still more common in the West and South.]

THE TRUE WAY OUT.

How shall this evil be remedied? The old system of making and maintaining roads by local authorities has been tried and found utterly wanting. The results we have before us in roads which through a large part of the year are almost impassable. Why not then have a State system? Of course there are difficulties. The first is the present inequality of taxation; but, with taxation properly adjusted, and the dwellers in the rural districts relieved as they should be, the making of the roads by the State would soon be recognized not as a burden but as a blessing. Then, too, there is another difficulty which the farmers ought to study and overcome. Naturally, if the State takes charge of this matter, it must act through proper machinery; it must have a department or commission for that purpose properly organized, with its corps of engineers, and its means of doing the work.

In several of our sister republics, with their proper civil service, with employés appointed for fitness, given great powers, held to strict responsibility, and not removed in obedience to political bosses at every turn of the political weathercock, there is no especial difficulty in this matter. But if the system is to be continued with us which has been so largely pursued, and which is the greatest curse to this country, namely the system of appointing men with little or no regard to special qualifications or personal character, but from political considera-

tions, merely because they do this or that political leader's dirty work, then it is evident that nothing is to be hoped for. If the building, improvement, and maintenance of roads is to be carried on by political hacks no good results will be obtained. Here, too, the farmers should think and act; more and more they should bring pressure to bear for extending throughout the State the system under which all subordinates are appointed for merit, and continued as long as they serve thoroughly well. If the allied farmers shall insist that this better system of appointments be adopted in obedience to their legitimate needs, and not to the political needs of this demagogue or that office seeker, then a thoroughly good system of roads could be carried out in our country as it has been in other countries, and especially in our sister republics.

WHAT SWITZERLAND HAS DONE.

To show how such a system has been developed under other republics based on principles similar to our own, take Switzerland. It is a democratic republic, far more democratic, indeed, than our own; so much so that it will not have even a president or a governor in our sense of the word at the head of its administration, and will not intrust either to its executive, its legislative, or its judicial bodies anything like the power which we give to ours. And still, though a far poorer country than our own, a country in which there are at least ten times as many obstacles to the making and maintaining of good roads as there are here, they have the most perfect lines of internal communication, reaching to every corner of the republic. Nor are these roads in the thickly-settled parts of that country alone. On the contrary, they run through parts very sparsely inhabited. In these, as in other districts, the roads are most carefully planned, skillfully executed, and thoroughly maintained. The difficulties are simply amazing, both from the geography and the climate of that republic. As to the latter, traveling once along a road leading to one of the mountain passes, the driver pointed out to me a piece knocked off the crossbar of a telegraph pole, fifteen or twenty feet from the ground, and said very simply: "That I knocked off last winter by running against it in my sleigh." The best engineering skill has been required to surmount the vast natural obstacles of that country; the mountain passes, the deep valleys, the abrupt gorges, the points exposed to avalanche and flood. There are scores of places in that little republic where from a mountain top one may see road after road winding like ribbons along the mountain side, passing under themselves or crossing over themselves at various points, but in all parts solidly built, with bridges of stone, with tunnels for avoiding avalanches, with roadbed of broken stone, hard and smooth, with paved channels to carry off the water, and with piles of broken stone at various points, so that the first moment any damage to the roadbed appears it may instantly be made good before the injury spreads. All this roadmaking and road-maintaining goes on in that most thrifty of republics as a thing of course. The authorities elected by the people are selected with care and held to strict account. They would be considered by themselves, their families, and the public at large as eternally disgraced if they should, from political or personal motives, allow these public works to be badly built or poorly maintained.

The Swiss republican democracy has learned not to be hoodwinked by demagogues, controlled by bosses, or misled by phrases. In its road-building, as in its general management, it "means business." No amount of windy declamation, or blackguardism, or buffoonery by stump orators can divert it from its fixed idea, that the first duty of citizens is to see that their country is thoroughly well governed.

It may be said that Switzerland is an old country; but here comes in a mistake with which we in America too often soothe ourselves and apologize for our own follies. The States of New York and Pennsylvania are old States. Parts of them have been settled for 250 years. There has been ample time for the development here of those good public works which our sister republics in other parts of the world have. This great development of road-building in Switzerland has been made almost entirely during the present century; indeed, the larger part of it during the last twenty-five years Our own great States have no longer the excuse of youth; they can plead the "Baby Act" no longer.

I might cite other countries, but I will simply give briefly some reflections on the movement for better roads which occur to me.

HOW GOOD ROADS PAY.

First, better roads would certainly enhance the value of farm property far more than farmers generally think. They would give an enormous impulse to the whole interior circulation of travel and traffic; they would cheapen the conveyance of produce to the railways and canals far more than is seen at first sight. They would make rural life attractive as it is not now; they would greatly diminish bills for injury and breakage of various sorts to animals, vehicles, and freights. As stated in a former article [AMERICAN AGRICULTURIST for January, 1891], this country differs from every other in the fact that here alone the better class of farmers steadily desire to get off their farms into the villages, whereas, in all other countries the tendency is for the inhabitants of villages and cities, the moment they acquire a competence, to move into the country. This is especially seen in Great Britain, and the leading reason is that in that country all the rural districts are easily accessible in all seasons of the year, and circulation in them is always easy and pleasant. Their roads are simply perfect; it is a pleasure to roll along them even in the worst parts of the year.

Secondly, with a proper organization, having as its end the good of the farming community and not the petty political advancement of bosses, a good system of roads is perfectly feasible with us. Such institutions as Cornell University, Columbia College, the Rensselaer Polytechnic, the Sheffield School, the Massachusetts, Stevens, and other Institutes of Technology, and a great number of other institutions, are supplying us with admirable engineers, who know the best methods of laying out, making, and maintaining roads. We have unlimited amounts of the best material for making them; American ingenuity has perfected the stone crusher and the steam roller, so that we have a means of solidifying our highways which, up to a recent period, other countries have not had. All that is needed is a proper State system carried out for the public good, and in accordance with civil service methods; that is, with methods which appoint subordinates with reference to their ascertained fitness, and not with reference to their servility in doing the dirty work of politicians.

The movement for good roads is spreading far and wide. Not only have New York and Pennsylvania been aroused, but men are at work in the Legislatures of Indiana and other Western States to better legislation, providing for State systems of road-making, and a public spirited citizen of Massachusetts has offered large prizes for the best essays on the subject. Let public-spirited men throughout this and other States take up this matter, write to their supervisors, members of Assembly, and State Senators, thus proving that they are in earnest, and that the vile old order of things in this respect must pass away.

JUST HOW TO GET GOOD ROADS.

The three things necessary to bring this about are first, a fair system of taxation, giving fair relief to the farming population; secondly, a proper civil service in which appointments shall be made for merit ascertained by proper practical examinations; and thirdly, a wisely devised State system of road-building and road-repairing, beginning first with the more important highways, and developing year after year through the less important roads leading into them.

And finally, it is to be hoped that when the farmers thus get good, hard roads, well located, well built, they will gladly unite in making and living up to regulations under which all wagons carrying heavy burdens shall in this, as in other republics, have wheels with broad tires, thus making every load a means of consolidating roads rather than destroying them.

The Department of Agriculture.

The appropriations for this department by the Fifty-first Congress, for the fiscal year ending June 30, 1892, were $1,345,400, and for the year ending June 30, 1891, $1,154,100, or a total for the two years of $2,499,500. For the preceding two years, the appropriations were $1,119,005 and $1,161,741 or a total by the Fiftieth Congress for two years of $2,280,746. Thus the increased support actually accorded it since the bureau became an executive department is only $218,754 for two years, or $109,377 per year. This sum certainly is not much of an increase for an executive department in charge of interests in which half of our total population are engaged. The appropriations for agricultural experiment stations in the respective States ($15,000 annually to each) amount to $728,000 for the ensuing, and $675,000 for the present fiscal year. This legislation is included in the Department of Agriculture's bill, but the department has no part of or power over the money, and it is very properly thrown out of the foregoing comparison. So too, the money for running the Weather Bureau ($900,000) is charged to the Agricultural Department but is simply a transfer from the War Department. Secretary Rusk calls attention to the fact that while the Agricultural Department proper thus has for the present fiscal year only a little over one million dollars, the appropriations for the other departments are in round millions: State, two; Treasury, 29; Navy, 25; Interior, 121. An itemized statement of the Agricultural Department's receipts for the two current fiscal years may be obtained from Secretary Rusk at Washington.

Of International Interest.

The United States Congress by act of August 30, 1890, provided for the strict inspection of all live cattle intended for export, and for their proper transportation and inspection before landing upon arrival on the other side. Unless exporters comply with the regulations imposed by the Secretary of Agriculture under this law, clearance papers are refused the vessels carrying their cattle. This law, therefore, guarantees the absolute healthfulness of our cattle upon arrival in foreign markets. It is now supplemented by the act of March 3, 1891, which provides for the inspection of all live stock before and after slaughter, also the products thereof, that are intended for interstate or foreign commerce. This being the most comprehensive system of inspection ever adopted by a government, we publish almost entire the rules of March 25, issued by the Secretary of Agriculture to govern the matter. It is probable that by the time this reaches the readers' eyes, Germany will have formally recognized the efficacy of the United States inspection laws by annulling her unjust prohibition of American pork. France must soon do the same, likewise England. This will immensely stimulate the demand for our hogs and cattle, and insure the permanency of the present improving prices. Especially will this be so in view of the shortage in the supply of American cattle for domestic consumption that is beginning to be recognized.

2. The proprietors of slaughter-houses, canning, salting, packing, or rendering establishments, engaged in the slaughter of cattle, sheep, or swine, the carcasses or products of which are to become subjects of interstate or foreign commerce, will make application to the Secretary of Agriculture for inspection of said animals and their products.

3. The said application must be in writing, addressed to the Secretary of Agriculture, Washington, D. C., and shall state the location and address of the slaughter-house or other establishment, the kind of animals slaughtered, the estimated number of animals slaughtered per week, and the character and quantity of the products to go into interstate or foreign commerce from said establishment; and the said applicant in his application shall agree to conform strictly with all regulations or orders that may be made by the Secretary of Agriculture for carrying on the work of inspection at such establishment.

4. The Secretary of Agriculture, upon receipt of said application and after consideration thereof, will give said establishment an official number, by which all its inspected products will thereafter be known, and this number will be used both by the inspectors of the Department of Agriculture, and by the owners of said establishment, to mark the products of the establishment as hereinafter prescribed.

5. The Secretary of Agriculture will appoint and designate a veterinary inspector to take charge of the examination and inspection of animals and their products for each establishment which has been officially numbered, as prescribed by rule 3, and will detail to such inspector such assistants or other employees as may be necessary to properly carry on the work of inspection at said establishment. The inspector appointed, and all employees under his direction, shall have full and free access at all times to all parts of the building or buildings

(*Continued on Page* 304.)

"La Grippe" and Pneumonia.

Prevention Better than Cure.

Reports from medical sources show that "la grippe" is again prevalent, and in connection with its return it is important to note that a decided increase of mortality from pneumonia is recorded.

This should be a warning to all classes to take precautions against exposure and whatever tends to debilitate the system.

The trying changes of the weather, at this season, and the consequent cases of colds, influenzas, inflammation of the lungs, rheumatism, pains in the back, and the many other aches and pains caused by unavoidable or careless exposure, are things that cannot be neglected except at the risk of more serious consequences.

As attested by indisputable testimony, they may be both prevented and relieved by the timely use of

ALLCOCK'S POROUS PLASTERS

Beware of imitations, and do not be deceived by misrepresentation. Ask for ALLCOCK'S, and let no solicitation or explanation induce you to accept a substitute.

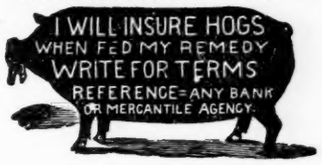
ETERNAL VIGILANCE

Is the Price of Liberty, and also of Immunity against Loss by Swine Diseases.

DO NOT WAIT

Until your Herds are sick—and perchance many are past treatment—but use in time

DR. JOSEPH HAAS'



Hog and Poultry Remedy

(Used successfully for 14 years.)

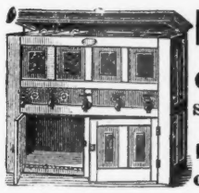
PREVENTS DISEASE. ARRESTS DISEASE.
STOPS COUGH. DESTROYS WORMS.
PRODUCES PORK. HASTENS MATURITY.

THOUSANDS OF TESTIMONIALS.

PRICES: 25-lb. cans, $12 50; $2.50, $1.25 and 50c a package. Largest are cheapest. Orders by mail receive prompt attention.

Write for Circulars Send 2c stamp for "Hogology," a 64-page pamphlet on swine. [Mention this paper.]

JOSEPH HAAS, V. S., Indianapolis, Ind.



MOSELEY'S OCCIDENT CREAMERY.

SOLD ON MERIT.
Send for Special Introductory Offer.
Freight Paid by us.
MOSELEY & PRITCHARD MANUFACTURING CO.,
Clinton, - - Iowa.

HARTSHORN'S SELF-ACTING SHADE ROLLERS

Beware of Imitations.
NOTICE AUTOGRAPH OF Stewart Hartshorn ON LABEL AND GET THE GENUINE HARTSHORN

A ROBBER OR THIEF

Is better than the *lying* scale agent who tells you as gospel truth that the

Jones' $60. 5 Ton Wagon Scale

is not a standard scale, and equal to any made. For free book and price list, address

Jones of Binghamton, Binghamton, N.Y.

PRESSES, DIES AND OTHER FRUIT CAN TOOLS

FOR SEALING TOPS AND CAPS
FERRACUTE MACHINE CO
BRIDGETON, N.J.

JAY-EYE-SEE CHECK HOOK

$50 PAID IF CHECK REIN IS THROWN FROM THIS HOOK.

Fitted to any harness, old or new, in five minutes. Any style of check rein can be used. Nothing to get out of repair. Rein adjusted as easily as with common hook. Ask your harness dealer to get you one. If he will not we will mail you one, post paid, **50c.** in nickel plate, rubber finish, or rubber with gold lining. Endorsed by Jackson I. Case, Edwin C. Bither, Peter V. Johnson and all horsemen.

JAY-EYE-SEE HOOK, PAD & TERRET CO.,
RACINE, WISCONSON.

H.W. JOHNS' ASBESTOS LIQUID PAINTS

SEND FOR SAMPLE CARD AND DESCRIPTIVE PRICE LIST.

H. W. JOHNS MANUFACTURING CO.,

Sole Manufacturers of H. W. Johns' Asbestos Roofing, Sheathing, Building Felt, Asbestos Steam Packings, Boiler Coverings, Roof Paints, Fire Proof-Paints, etc.

VULCABESTON Moulded Piston-Rod Packing Rings, Gaskets, Sheet Packing, etc.

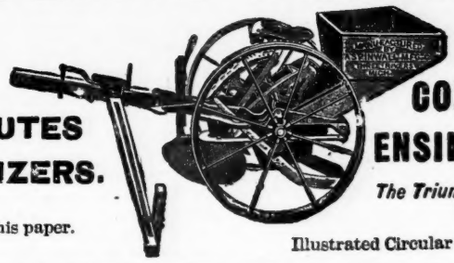
Established 1858. 87 MAIDEN LANE, NEW YORK. PHILADELPHIA, CHICAGO, BOSTON, LONDON.

"PLANET JR."

FARM AND GARDEN TOOLS FOR 1891.

BETTER, Both Horse and Hand, THAN EVER; better and more money saving. We cannot describe them here, but our new and handsome catalogue is **Free** and interesting. A goodly number of new tools will meet your eye there. Among these, **The Gardener's Eleven-Tooth Harrow, Cultivator** and **Pulverizer** combined, adjustable teeth; **Market Gardeners** and **Beet Growers Special Horse Hoe** with **Pulverizer; Special Furrower, Marker** and **Ridger,** adjustable wings; **Sweet Potato Horse Hoe,** four tooth with **vine turner;** New **Nine Tooth Cultivator** and **Horse Hoe** combined; **Special Steel Leveler** and **Pulverizer** combined; all interesting, nothing we have ever made so practical and perfect. Some improved things, too, are grafted upon our older favorites. A capital **LEVER WHEEL, instantly adjustable** for depth, is a great feature; put on all '91 Horse Hoes and Cultivators, &c., unless ordered otherwise. Nor have our Hand Seed Drills been forgotten in the march of improvement, nor our Double and Single Wheel Hoes, Garden Plows, Grass Edgers, Etc. Some of them are greatly altered for the better; and do not forget that *no novelties are adopted by us without actual and exhaustive tests in the field.* We therefore guarantee everything exactly as represented. **Send for Catalogues now. S. L. ALLEN & CO., 1107 Market St., Philadelphia, Pa.**

"ASPINWALL" POTATO-PLANTER



DISTRIBUTES FERTILIZERS.

PLANTS CORN, BEANS, ENSILAGE, ETC.

The Triumph of Modern Invention.

Mention this paper.

Illustrated Circular sent free.

ASPINWALL MFG. CO., Three Rivers, Michigan.

ISSUES OF THE DAY.

(*Continued From Page 302.*)

used in the slaughter of live animals and the conversion of their carcasses into food products.

6. The veterinary inspector in charge of said establishment will carefully inspect all animals in the pens of said establishment about to be slaughtered, and no animal shall be allowed to pass to the slaughtering room until it has been so inspected. Whenever any animal is found on said inspection to be diseased, said animal shall thereupon be condemned by the inspector, and the owner of the same shall at once remove it from the premises and dispose of it in such manner as may be provided by the laws of the State in which said animal is located.

7. The veterinary inspector or his assistant shall carefully inspect at time of slaughter all animals slaughtered at said establishment and make a post-mortem report of the same to the Department. Should the carcass of any animal, on said post-mortem examination, be found to be diseased and unfit for human food, the said carcass shall at once be removed from said establishment under the supervision of the inspector and be disposed of in the manner provided by the laws of the State where slaughtered. Any owner of any establishment in which inspections are being made under the provisions of the act of March 3, 1891, who shall willfully cause or permit any animal which, upon inspection, has been found to be diseased to remain on said premises beyond the time allowed by the inspector in charge for its removal, shall forfeit his right to inspection, and said establishment will, for such time as the Secretary may direct, be refused certificates of inspection upon its products.

8. The carcasses of cattle which leave said establishment as dressed beef will be stamped by said inspector with a numbered stamp issued by the Department of Agriculture, and a record of the same will be sent to the Department at Washington.

9. Each and every article of food products made from the carcasses of animals inspected will be labeled or marked in such manner as the owner of said establishment may direct; said label, however, must bear the official number of the establishment from which said product came and also contain a statement that the same has been inspected under the provisions of the act of March 3, 1891. A copy of said label must be filed at the Department of Agriculture, Washington, D. C., and, after filing, said label will become the mark of identification showing that the products to which it has been attached have been inspected, as provided by these rules and regulations, and any person who shall forge, counterfeit, alter, or deface said label will be prosecuted under the penalty clause of section 4 of the act of March 3, 1891. Each and every package to be shipped from said establishment to any foreign country must have printed or stenciled both on the side and on the top, by the packer or exporter, the following:

FOR EXPORT.

a. Official number of establishment.
b. Name of packer.
c. Location and State of factory.
d. Net weight of contents.
e. Name of consignee and point of destination.

In case said package is for transportation to some other State or Territory, or to the District of Columbia, in place of the words "for export" the words "INTERSTATE TRADE" shall be substituted. The letters and figures in the above print shall be of the following dimensions: The letters in the words "For Export" or the words "Interstate Trade" shall not be less than three-fourths of an inch in length, and the other letters and figures not less than one-half inch in length. The letters and figures affixed to said package shall be legible and shall be in such proportion and of such color as the inspector of the Department of Agriculture may designate.

10. The inspector of the Department of Agriculture in charge of said establishment, being satisfied that the articles in said packages came from animals inspected by him, and that they are wholesome, sound, and fit for human food, shall affix to the top of said packages meat-inspection stamps to be furnished by the Department of Agriculture, said stamps bearing serial numbers, and the inspector will write on said stamps the date of inspection. The stamp must be securely affixed by paste and tacks in such a way as to be easily read when the package is standing on its bottom. Not less than five tacks shall be driven through each stamp, one at each corner and one in the middle of the stamp. The stamp having been affixed, it must be immediately canceled. For this purpose the inspector will use a stencil plate of brass or copper, in which will be cut five parallel waved lines long enough to extend beyond each side of the stamp on the wood of the package. At the top of said stencil will be cut the name of the inspector and at the bottom of said stencil will be cut the district in which inspection is made. The imprinting from this plate must be with blacking or other durable material, over and across the stamp, and in such a manner as not to deface the reading matter on the stamp, that is, so as not to daub and make it illegible. The stamp having been affixed and canceled, it must immediately be covered with a coating of transparent varnish or other substance. Orders for stamps must be made by the inspector on the chief of the Bureau of Animal Industry.

11. Whenever any package of meat products bearing the stamp of inspection shall have been opened and its contents removed for sale the stamp on said package must be effaced and obliterated from the package.

12. Reports of the work of inspection carried on in every establishment will be forwarded to the Department by the inspector in charge, on such blank forms and in such manner as will be specified in "instructions to inspectors of slaughtering establishments.

13. The inspection of swine for export or interstate trade will be conducted in the same manner as prescribed in the foregoing rules, with the addition, however, that a microscopic examination for trichina will be required for all swine products.

14. When the slaughtered hog is passed into the cooling room of said establishment, the veterinary inspector in charge, or his assistants, will take from each hog two samples of muscle, one from the "pillar of the diaphragm" and the other from another part of the body, and said samples will be put in a self-locking tin box and a numbered tag will be placed upon the hog from which said samples have been taken and a duplicate number of said tag will be placed in the box with said samples. The boxes containing the samples from the hogs in the cooling room, so tagged, will be taken to the microscopist for such establishment, who shall thereupon make a microscopic examination of each box containing samples, and shall furnish a written report to the inspector in charge of the cooling room, giving the result of said microscopic examination together with the numbers of the hogs from which samples have been examined.

15. All hogs reported by the microscopist to the inspector in charge of the cooling room to be affected with trichina will at once be removed from said cooling room of said establishment under the supervision of said inspector or one of his deputies, and be disposed of by the owner in such manner as may be required by the laws of the State where said factory is situated.

16. The inspector in charge of the slaughtering or other establishment will issue a certificate of inspection for all carcasses of animals or the food products thereof which are to be exported into foreign countries, which certificate will cite the number of the factory, the name of the owner or owners operating the same, the date of inspection, and the name of the consignee and country to which said articles are to be exported. Said certificate will also contain the numbers of the stamps attached to the articles to be exported. One certificate only will be issued for each consignment. The certificates will be issued in serial numbers and in triplicate form. One copy thereof will be delivered to the consignor of such shipment, one copy will be attached to the invoice or shipping bill to accompany the same and be delivered by the transportation companies to the chief officer of the vessel upon which said consignment is to be transported, and the third copy will be forwarded to the Department of Agriculture for filing therein.

The Coming of Agricultural Prosperity.

The remarkable character of the article by Mr. C. Wood Davis in the present issue is heightened by the fact that the boom in our agricultural industries which he predicts is already here. Wheat for delivery at New York in May has sold above $1.17 per bushel. Every day confirms the shortage of the European wheat crop. Meat products are already advancing. The reasons for still higher prices and a more active demand for cattle and hogs and their products, both at home and abroad, are given in the previous article. The supply of cereal crops in the United States at this season is lower than ever before. Yet our new wheat crop is coming on famously, and it looks as though we should be able to put our own price upon the crop, however large. This means higher prices for everything the farmer produces and immense business for the railroads. When the farmers and the railroads are both happy at receiving good prices, prosperity is insured for every industry.

This may be a rosy view, but it should be noted that it is one upon which the markets of the world are already banking. Prices are jumping up daily, but dealers and speculators, both at home and abroad, are buying freely at the advance. It is true that the financial condition of the people of France, Germany and England has been seriously crippled by their speculations in Argentina. But those countries must have bread, and with a short wheat crop are bound to buy of the United States. Moreover, after such a lesson in wild-cat speculation in South America, English investors are already turning their attention to more solid openings for capital in the United States. Farmers must be prosperous this fall.

Seasonable Hints.

Unfruitful Apple Trees.—F. F. Evans, Kent Co., Del.: It is certainly rather strange that your thrifty and healthy apple trees should fail to bear fruit. If the fruit sets and then drops off before maturing we should suspect that the failure was due to the presence of the codlin moth, but you say nothing about the dropping of the apples, but merely that the trees do not bear and that they have failed for the "past six years." If the codlin moth is the cause of failure, then we would advise spraying the trees when in bloom with London purple, Paris green or some similar poison. Otherwise, root pruning may prove advantageous.

Fighting the Ground Mole.—J. F. Woodin, Lincoln Co., Ark., writes us: Having wrestled with the ground mole for years, with various traps and deadfalls, I have at last hit upon a plan, which seems to "fill the bill." With a sharp pointed knife lift up the kernel of a grain of corn, leaving it attached to one side of the grain and then put a little strychnine under and press it back again. With a small round stick make a hole in his run or burrow and drop the loaded grain in, "his first visit will be his last." It is a good plan to fix fifty or one hundred grains in this way, put them in a wide mouth bottle properly labeled, and when you see mole runs drop in a grain or two.

Green Fly on Lettuce.—Robert B. Treat, Kent Co., R. I.: The small insects on the leaf of lettuce you send are the common green fly or aphis, and may be easily destroyed by fumigating your hotbeds with tobacco. Take a large flower pot and set it on two bricks so that the air can pass in through the hole in the bottom of the pot, then throw in a few live coals, and fill up with slightly moistened tobacco stems or other tobacco. Close up the frames tight to keep in the smoke and leave over night. Next morning open the frames and syringe the lettuce plants with pure water. If the flies appear again repeat the fumigating until all are destroyed. Tobacco water will answer, but there is more danger of leaving some taint of it on the lettuce than when only tobacco smoke is used as an insecticide.

Grafting the Grape.—J. J. B., Hadfield, Marion Co., Ind.: In grafting grapevines that are an inch or more in diameter, cut them off two or three inches below the surface of the ground, then insert the cion just as you would in a branch of an apple tree of the same size. Wind with a piece of cord or bass bark—no wax should be used—and after tying, draw the soil back, covering the stock and cion, leaving only the upper bud on the latter exposed. We prefer performing the operation as early in the spring as possible, or as soon as the frost is out of the ground, and before the buds show any signs of growth. Some vineyardists cut the cions in winter and store them in a cool place where they will remain dormant until the vines have pushed some of their leaves, then the cions are inserted as we have directed. We may say, however, that grafting the grape is rarely a success except when performed by those who have had considerable experience in the propagation of vines. Try it, and secure the needed experience.

Proclaim the Victory

Remember last winter's siege. Recall how trying to health were the frequent changes of the weather. What was it that helped you win the fight with disease, warded off pneumonia and possibly consumption? Did you give due credit to **SCOTT'S EMULSION** of pure Norwegian Cod Liver Oil and Hypophosphites of Lime and Soda? Did you proclaim the victory? Have you recommended this wonderful ally of health to your friends? And what will you do this winter? Use Scott's Emulsion as a preventive this time. It will fortify the system against *Coughs, Colds, Consumption, Scrofula, General Debility, and all Anæmic and Wasting Diseases (specially in Children).* **Palatable as Milk.**

SPECIAL.—Scott's Emulsion is non-secret, and is prescribed by the Medical Profession all over the world, because its ingredients are scientifically combined in such a manner as to greatly increase their remedial value.

CAUTION.—Scott's Emulsion is put up in salmon-colored wrappers. Be sure and get the genuine. Prepared only by Scott & Bowne, Manufacturing Chemists, New York. All Druggists.

The Factory Price of a good many things bears mighty little comparison with the price you have to pay your retailer for the same goods, yet if the factory tries to get in closer relations with you the chances are that you give it the cold shoulder. Take it in knives. The knife shown here should retail at 75c, and bring $6 by the dozen, but we have been offering them to you postpaid at **48c**; 5 for **$2**. Fine 3-blade pen-knife, **$1**. Lady's 2 blade pearl, **35c.**; Seven-inch scissors, **75c.**; Knife and Scissors, **$1.15**; Pruning knife, **75c.**; Grafting **25c.**; Budding **55c.** Pruning Shears, **90c.**, post paid. Hollow ground razor, **$1.25**. Best Strop ever made, **50c.**

Maher and Grosh,
4 S Street,
TOLEDO, OHIO.

EUREKA SPRING TOOTH HARROWS
BEST MATERIAL.

SIZES:
16, 18 and 22 Tooth
Channel Steel Frame.
A Harrow that will not clog or bury. No bolt holes in teeth. A great favorite and acknowledged the **lightest and strongest Harrow now in the market.**

EUREKA CULTIVATORS
ALL STEEL FRAME.
FINEST WORKMANSHIP.
SOMETHING NEW AND NOVEL.

OUR LATEST IMPLEMENT **Same Frame** may be used for 5 or 7 tooth, Shovels or Spring Teeth, with three or five Spring Teeth in front, and horse hoe attachment in the rear for a **hiller. Easy Ratchet Adjustment,** enabling operator to widen or narrow in the field. Furnished with any style of points desired. This Cultivator has no equal. Also the **New EUREKA WIDE-CUT MOWER** for **1891.** Send for catalogue and full description. Our goods are all of the best stock, honestly made and nicely finished. Address

EUREKA MOWER CO. UTICA, N. Y.

J. I. CASE THRESHING MACHINE CO.,

RACINE, - - WIS.,

— MANUFACTURERS OF —

IRONSIDES AGITATORS

HORSE POWERS, SWINGING STACKERS,

TREAD POWERS and SAW FRAMES, SAW MILLS and ENGINES.

They Are Far Ahead of All Others in Good Work and Durability. Catalogue FREE.

P. P. GREEN POTATO BUG POISON - 2.50 per 100 lbs. York Chemical Works, York, Pa.

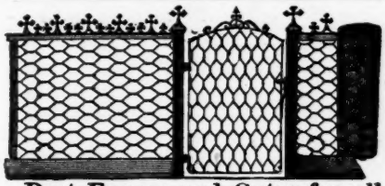
BEECHAM'S PILLS
Cure SICK HEADACHE.
25 Cents a Box.
OF ALL DRUGGISTS.

ROUND AND SOLE TILE Also agents for Akron Salt Glazed Pipe, Fire Brick and Cement. (Established 1859.)

JACKSON BROS.
NEW YORK STATE DRAIN TILE AND PIPE WORKS,
88 Third Avenue, ALBANY, N. Y.

$10 I will pay a few Ladies $10.00 Weekly to do light work for me in their locality at home. Good pay for part time. Write with stamp. Address Mrs. F. C. FARRINGTON, Box 702, Chicago, Ill. **$10**

SEDGWICK FARM FENCE
PRICES REDUCED



Best Fences and Gates for all purposes. Free Catalogue giving full particulars and prices. Ask Hardware Dealers, or write

THE SEDGWICK BROS. CO. RICHMOND, IND.
General Eastern Agent, EDWARD SUTTON, 300 Market street, Philadelphia.

No other preparation so meets the wants of a debilitated system as Ayer's Sarsaparilla.

OUR LIBRARY CORNER.

Two Valuable Reports.

NEW YORK (Cornell)—Third Annual Report, pages 54. The director gives a history of the station and figures and describes a proposed building to be used by the station staff; such structure to cost $80,000. This will make a very generous provision for the investigations of the station. The chemical work of the station during the past year has been analyses of farm products as fodders, milk, etc. In vegetable pathology much work has been done upon clover rust, blight of quince, the apple scab fungus, etc. The importance of vegetable physiology as a study in connection with the fungous diseases is urged. Under entomology a figure is given of the insectary; a most valuable adjunct in the study of the economic relations of insects. In this greenhouse-like structure insects can be carried through their various phases of development. Wireworms have been extensively studied. They live for several years in the larval state, and nearly a year in the pupa condition. These facts indicate that fall plowing is a very effective method of checking the ravages of the wireworms. In the horticultural department forcing structures have been built and winter experiments with various crops are carried on. A garden herbarium is being established, in which the cultivated species and their varieties are to be found from all parts of the world. Tomatoes, cucurbits, egg plants, plums and cherries, and the brambles are groups of plants receiving particular attention.

Bulletin 24 treats of the clover rust due to a parasitic fungus, *Uromyces Trifolii*, and is propagated through the growing season by spores. These spores prefer a low temperature for germination and, therefore, during the hot weather but little rust appears. The second crop (rowen) is most affected as a rule. One of the questions remaining unanswered is the mode of hibernation of the fungus. It is suggested that when the second crop is badly infested it be plowed under.

CONNECTICUT—Fourteenth Annual (Mycologist's) Report, pages 36. A large portion of this report is taken up with a full treatment of the cause of the scab of potatoes. This old enemy has been thoroughly investigated. There have been many theories as to the origin of the disease, excessive moisture, mechanical irritation, chemical action, fertilization, all of which fail to furnish a satisfactory reason for the phenomenon. A disease has been worked out of a bacterial origin, but the one here offered is still different. It is due to a minute fungus that can be cultivated, and by inoculation of the tubers will produce the scab. Thus a monogram can be produced upon an otherwise healthy potato by sowing the fungous germs. The work with this disease has not gone far enough so that means of remedying the trouble can be given. Many other fungi are reported upon as the potato rot upon the tomato, several forms of insect—infesting fungi, rust of pears and clover, etc. Good results are shown in spraying for the leaf spot, grape rot, potato blight, and particularly the smut of the onion. Under fungicides and their application several standard formulæ are given, and nozzles, hose, pumps, etc., treated. A cheap and easy preparation of am-copper solution is given as follows: One-half pound of pulverized sulphate of copper and one pound of hard transparent carbonate of ammonia also pulverized. This produces a mixture of equal value with the old formulæ at much less expense.

The Latest Publications.

FUNGUS DISEASES OF THE GRAPE AND OTHER PLANTS AND THEIR TREATMENT: F. Lamson-Scribner, Prof. of Botany in the University of Tennessee, etc., pp. 134, cloth, **J. T.** Lovett Company, Little Silver, New Jersey.

The want of a treatise of this kind has long been felt by the fruit-growers of America. Much useful information on the treatment of plant diseases has appeared from time to time in the Experiment Station and Department of Agriculture bulletins, but these publications are not available to the vast majority of fruit growers. In the book before us Professor Scribner has brought together into succinct form a full and plain account of all the diseases affecting grapes and other fruits in various parts of the country, to which have been added simple directions for their treatment and ultimate eradication. After explaining very satisfactorily what fungi are, the various diseases of the grape-root, vine, leaf, and fruit are fully con-

(*Continued on Page* 310.)

HENDERSON'S

American Farmer's Manual

Is the most complete catalogue of Farm Seeds ever issued. It is fully illustrated, and contains much valuable information on the subject of

GRASSES

and other farm matters. Sent free on application.

PETER HENDERSON & CO.,

Nos. 35 & 37 Cortlandt Street, New York.

PROTECT YOUR GRAPES

WITH THE OHIO GRAPE PROTECTORS.

Thoroughly protect the grapes while maturing and ripening. Prevent blight and mildew.

Grapes thus covered ripen to perfection.

Made of specially prepared waterproof paper

Instantaneous Attachment.

☞ *A hundred bunches can be covered in a few minutes.*

SOMERSET, KY., Sept. 20, 1890.
They worked to my entire satisfaction. Easily put on, and prevented mildew. I will want more next year.
J. M. RICHARDSON.

OTTUMWA, IA., Oct. 22, 1890.
The Protector I regard as very valuable. The grapes I covered are now in perfect condition. Those not covered are all gone. I shall want more next year.
J. T. HACKWORTH.

PRICES: 500, $1.50; 1000, $2.50.

Special Discount for large quantities.
Sample 100 sent on receipt of Fifty Cents.
OHIO GRAPE PROTECTOR CO., Ironton, O.

BUY YOUR SEEDS OF

"The Old Reliable Seed Store,"

ESTABLISHED IN 1843.

New and Fresh Stock.
All Old Seeds Burned.
Novelties and Choice Tested Seeds.
Catalogues Free.

The Geo. L. Squier Mfg. Co.,
Successors to The Higganum Mfg. Co., and R. H. Allen & Co.
P. O. Box 3454, New York City.

BURPEE'S SEEDS GROW.

"Yale" Strawberry.

The coming **LATE** Strawberry for the table, for canning, or for Market. For further information send for circular. Address **STEPHEN HOYT'S, SONS,** New Canaan, Ct.

ATLANTIC PRIZE TOMATO PLANTS FOR Sale, supposed to be the very earliest large tomato on earth. By mail $1 per dozen. Larger orders express or freight. Special rates.
D. DUROE, Box 37, Landisville, N. J.

Choice Flower Seeds.

Grown and sold by MILTON E. FISK, Lunenburg, Mass. Send for catalogue and receive a sample packet free.

SMALL FRUITS! Plants, Vines, &c. Best varieties, both **New** and **Old.** Send for price list. Address **IRVING ALLEN,** Springfield, Mass.

A CHANCE TO MAKE MONEY.
Salary and Expenses paid, or Commission if preferred. Salesmen wanted. No experience needed. Address, stating age.
H. W. Foster & Co., Nurserymen, Box M, Geneva, N.Y.

10 cts. Pays for One Bulb

of the LOVELY, NEW, LEMOINE (Butterfly) GLADIOLUS, a packet of 20 kinds of New and Beautiful Flower Seeds, and a 4 months' trial subscription to the Mayflower, the best paper on flowers and gardening published. It is an elegant, illustrated Monthly of 16 pages devoted to flowers, fruits and gardening. Edited by JOHN LEWIS CHILD, assisted by many of the most eminent Horticulturalists, writers and travelers in all parts of the world. Articles by Henry M. Stanley and Maj. Jephson on the flowers seen in Africa, will shortly appear; Flowers and gardens of the Sandwich Islands, Australia, New Zealand, South America, China, Japan, Samoa, Egypt; growing of bulbs in Holland and Guernsey, seeds in Germany, Clematis and Begonias in England, Narcissus in Ireland, etc., and scores of like interesting and useful articles by eminent growers and writers. It teaches how to care for plants in the house, and flowers, fruits and vegetables in the garden. Subscription price 50 cents per year.

☞ **WE SEND IT 4 MONTHS AND THE BEAUTIFUL PREMIUM GLADIOLUS and SEEDS for ONLY 10 CENTS THAT YOU MAY BECOME ACQUAINTED** with its merits. The packet of seed is composed of over 20 choice new sorts which will make a magnificent bed of flowers all summer. The Lemoine Gladiolus is a lovely new sort, giving great spikes of bloom which are of brilliant, butterfly-like colors. All sent by mail postpaid. Get 5 of your friends to accept this offer with you and we will send you for your trouble a lovely Amaryllis bulb. For 10 of these subscriptions we will send the Wonderful, Ever-blooming Mary Washington Rose. For 20 we will send 5 elegant new perpetual blooming plants (including Mary Washington Rose) such as will astonish you with their beauty. Write at once—this offer will not appear again. Add's

THE MAYFLOWER, Floral Park, NEW YORK.

When writing to advertisers, be sure and mention the
AMERICAN AGRICULTURIST.

Helpful Hints.

Cannot Miss a Single Number.—I cannot miss a single number of the AMERICAN AGRICULTURIST. I get too much information out of it.
C. W. MEAZLE, Cherokee Co., Texas.

The Mayflower, Floral Park, N. Y. A 16 pp. illustrated monthly paper devoted entirely to flowers and gardening. Has a larger circulation than almost any other paper of its class. Subscription price, fifty cents per year.

Deserving Success —I am not a farmer, but I appreciate your liberality and enterprise in inducing farmers to grow better crops. You deserve all success and support.
WILL B. TAYLOR, Randolph Co., Ill.

The Garry Iron and Steel Roofing Co., 152 Merwin street, Cleveland, O. Price list for 1891, besides trade price list contains approximate weights of painted iron and steel roofing and the uniform rules of measurement established by the National Roofing Association. Also an illustrated catalogue of all kinds of iron and steel roofing and accessories, issued by the same company.

An Improved Spray Pump.—In spraying plants and fruit trees with Paris green or London purple it should be borne in mind that these substances are not soluble in water, and that in using them it is of importance to keep the mixture well stirred, so as to insure uniform strength. This object is attained in a highly satisfactory degree in the Mand's Double-acting Spray Pump, manufactured by the Lansing Iron and Engine Works, Lansing, Mich. These Pumps are provided with Brass Cylinders and Anti-Sand Valves, and are all that can be desired for the purpose they are intended.

Cornish, Curtis & Greene, Fort Atkinson, Wis.: Catalogue and price list for 1891 of butter and cheese apparatus for the farm, creamery and cheese factory. This beautifully illustrated catalogue contains everything needed in dairy work from a butter print up to an engine or a delivery wagon. The goods of this long established firm are reliable in every particular. Their new Babcock milk test is well worthy of careful consideration by all who need such an appliance. It tells the butter value of milk and cream in ten minutes and is highly recommended by many well-known practical men.

Farm Horses.—Jerry Thurston, Jr., Shawnee Co., Kan., is about to engage in breeding horses specially suited to the requirements of the farm and farmer. He desires the advice of the AMERICAN AGRICULTURIST that he may be enabled to start right. If all farmers throughout the United States were similarly situated as to soil, climate and product, the breeding of the farmer's horse would be a problem of ready solution. But these three elements of agriculture vary, not only in nearly every State, but in every county the character of soil varies. Suppose the greatest possible variation, why should not a universal farmer's horse be bred that shall answer nearly every demand? To a degree this can be done. It is true that where the soil is a heavy, tenacious clay, the traction is far greater than in a light soil. This can be overcome by increasing the number of the horses required. A single team is only sufficient for a comparatively small farm. But if the team of two horses is insufficient, make the team a three-horse instead of a two-horse team. But it costs one-third more to keep three than two horses. Truly, but if two horses can earn a living for a farmer and pay their own keep, why should not the rule hold equally good with three horses? It does certainly. The expenditure of horse flesh and feed cannot vary much in the relative number between two- and three-horse teams. Two horses overworked and fed on extra feed are neither economical nor reasonable. It is here that the third horse comes in to make the ledger show a favorable balance on the right side. Then there is always a saving in an extra horse, in the fact that the team need not be interrupted in its daily and necessary work by the demands of the family. Work done on time is an essential economy on the farm. No matter at what season or on what crop, time, done now, is the essential demand, as well as well done. Time to the farmer is as important as tide.

TO SUCCEED IN THE DAIRY.

Good cows are essential. Perfect cleanliness is necessary. But nothing is of greater importance than the use of a good color. Wells, Richardson & Co.'s Improved is guaranteed the strongest and most natural. It has been improved recently, and is now far ahead of all other colors. The largest butter buyers urge their customers to use this color, for it is sweet, pure, and its use can never be detected.

Don't allow your dealer to sell you any butter color but Wells, Richardson & Co.'s Improved Tell him the BEST is what you want, and you must have the Improved. It excels in strength purity and brightness, never turns rancid, always gives a natural June color, and will not color the buttermilk. Thousands of the best creameries and dairies use it.

Do you know that you can buy a chimney to fit your lamp that will last till some accident happens to it?

Do you know that Macbeth's "pearl top" or "pearl glass" is that chimney?

You can have it—your dealer will get it—if you insist on it. He may tell you it costs him three times as much as some others. That is true. He may say they are just as good. Don't you believe it—they may be better for him; he may like the breaking.

Pittsburg. GEO. A. MACBETH & CO.

THE NEW WEBSTER
JUST PUBLISHED—ENTIRELY NEW.

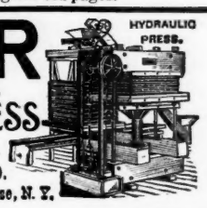
WEBSTER'S INTERNATIONAL DICTIONARY

A GRAND INVESTMENT
for the Family, the School, or the Library.
Revision has been in progress for over 10 Years.
More than **100** editorial laborers employed.
$300,000 expended before first copy was printed.
Critical examination invited. **Get the Best.**
Sold by all Booksellers. Illustrated pamphlet free.
G. & C. MERRIAM & CO., Publishers, Springfield, Mass., U. S. A.

Caution!—There have recently been issued several cheap reprints of the 1847 edition of Webster's Unabridged Dictionary, an edition long since superannuated. These books are given various names,—"Webster's Unabridged," "The Great Webster's Dictionary," "Webster's Big Dictionary," "Webster's Encyclopedic Dictionary," etc., etc.

Many announcements concerning them are very misleading, as the body of each, from A to Z, is 44 years old, and printed from cheap plates made by photographing the old pages.

CIDER MACHINERY.
POWER SCREW, HYDRAULIC, OR KNUCKLE JOINT PRESS.
Graters, Elevators, Etc.
Boomer & Boschert Press Co.
261 W. Water St., Syracuse, N. Y.



HORSE OWNERS!
TRY GOMBAULT'S
CAUSTIC BALSAM

A SAFE, SPEEDY AND POSITIVE CURE for Curb, Splint, Sweeny, Capped Hock, Strained Tendons, Founder, Wind Puffs, Skin Diseases Thrush, Diphtheria, Pinkeye all Lameness from Spavin Ringbone or other Bony Tumors Removes all Bunches or Blemishes from **Horses** and **Cattle.** Supersedes all Cautery or Firing. Impossible to produce Scar or Blemish. Every bottle sold is warranted to give satisfaction. Price **$1.50** per bottle. Sold by druggists, or sent by express, **charges paid,** with full directions, for its use. Send for descriptive circulars. Address
THE LAWRENCE, WILLIAMS CO., CLEVELAND, O.

WHITMAN'S PATENT PRESSES.
Steam, Full Circle and Half Circle.
FOR HAY, STRAW, WOOL, &c.
Always victorious. Have been Awarded more First Prizes in five years than all others combined. Awarded the Grand Prize Gold Medal and Special Grand Prize Object of Art at Paris Expo, and Field Trials. Guaranteed superior to any. Send for Circulars. Also make large line of Farm Machinery.
WHITMAN AGRIC'L CO., St. Louis, Mo.
The largest Hay Press manufactory in America.

ARTISTIC HANGINGS.

We shall be glad, at all times, to submit designs and samples of interior decorative hangings; to prepare plans and estimates for draperies in single rooms, apartments, country houses, halls, and churches.

We furnish the best church pew-cushion that can be made.

Scarfs, Table Covers, Piano Covers, Lambrequins, Panels always in stock.

James McCreery & Co.,
Broadway and 11th Street,
New York.

Tasty Wall Papers
cost no more than ugly designs. Whether you live in Texas or Oregon, you can buy from our immense stock, by our method, as well as if in Philadelphia. Our mail trade is the largest. Samples of beautiful selected papers sent for 8c.
A. L. DIAMENT & CO. 1206 Market St. Phila. Pa.

HAIR ON THE FACE, NECK, ARMS OR ANY PART OF THE PERSON
QUICKLY DISSOLVED AND REMOVED WITH THE NEW SOLUTION

MODENE

AND THE GROWTH FOREVER DESTROYED WITHOUT THE SLIGHTEST INJURY OR DISCOLORATION OF THE MOST DELICATE SKIN.

Discovered by Accident.—IN COMPOUNDING, an incomplete mixture was accidentally spilled on the back of the hand, and on washing afterward it was discovered that the hair was completely removed. We purchased the new discovery and named it MODENE. It is perfectly pure, free from all injurious substances, and so simple any one can use it. It acts mildly but surely, and you will be surprised and delighted with the results. Apply for a few minutes and the hair disappears as if by magic. It has no resemblance whatever to any other preparation ever used for a like purpose, and no scientific discovery ever attained such wonderful results. **IT CANNOT FAIL.** If the growth be light, one application will remove it permanently; the heavy growth such as the beard or hair on moles may require two or more applications before all the roots are destroyed, although all hair will be removed at each application, and without the slightest injury or unpleasant feeling when applied or ever afterward.—MODENE SUPERCEDES ELECTROLYSIS.—

—RECOMMENDED BY ALL WHO HAVE TESTED ITS MERITS—USED BY PEOPLE OF REFINEMENT.—

Gentlemen who do not appreciate nature's gift of a beard, will find a priceless boon in Modene which does away with shaving. It dissolves and destroys the life principle of the hair, thereby rendering its future growth an utter impossibility, and is guaranteed to be as harmless as water to the skin. Young persons who find an embarrassing growth of hair coming, should use Modene to destroy its growth. Modene sent by mail, in safety mailing cases, postage paid, (securely sealed from observation) on receipt of price, **$1.00** per bottle. Send money by letter, with your full address written plainly. Correspondence sacredly private. Postage stamps received the same as cash. (ALWAYS MENTION YOUR COUNTY AND THIS PAPER.)

LOCAL AND GENERAL AGENTS WANTED. MODENE M'F'G CO., CINCINNATI, OHIO, U. S. A. Manufacturers of high grade hair preparations. *Register your letter at any Post-office to insure its safe delivery* CUT THIS OUT AS IT MAY NOT APPEAR AGAIN

We offer $1,000 for failure or the slightest injury. EVERY BOTTLE GUARANTEED.

ANIMAL AILMENTS.

Old Sore.—John H. Mack, St. Joseph Co., Ind., has a colt that received a cut from a wire fence last fall. A scab comes on the sore and under it from a pouch or little mouth matter oozes. It is fistulous, and must be healed from the bottom. Cleanse the sore and throw with a small syringe half a teaspoonful of tincture of iodine into it once or twice and it will become dry.

Lockjaw. — In answer to the inquiry by a keeper of a large livery stable on Long Island, we state that we are not aware why this island is more liable to cause lockjaw in sick and injured horses and cattle. But that it does occur in both man and animals on Long Island more frequently than elsewhere is certain. Send for the veterinarian at once when the first symptoms become manifest.

Broken Knees. — This trouble most frequently results from weakness and sprung knees. Much can be done to prevent stumbling and falling on the knees by thick toe calks and flat heels of the fore shoes. When the knees are much bruised, sponging with hot water, applying an ointment of Balm of Gilead and lard equal parts, spread upon a thin piece of leather as a plaster, and wearing a knee boot will be found useful.

Jaundice or Yellows in Cattle.—P. Miller, Hopkins Co., Ky.: Animals thus afflicted have yellow eyes, deep, bile-tinged urine, and yellow skin. Give full-grown cattle a pound of glauber salts dissolved in warm water, followed every evening for three times by half a pound of linseed oil. Warm the oil and give from a bottle. Give ginger and gentian powdered, each half an ounce in their gruel. A handful of hay soaked in hot water and mangels should be the only food for a few days.

Bitter Milk.—W. H. Cutter, Santa Clara Co., Col., has a graded Jersey heifer which gives milk that makes bitter butter. Her feed has been wheat hay that has wild morning glory and California thistle mixed with it. "Can it be the thistle or morning glory that causes it?" It is both. Feed neither. Good flavored butter only comes from good, sound food from any cow. Feed ground oats and wheat bran, and clover or alfalfa hay, and the butter will be sweet. Mangels should be fed to every milch cow in winter.

Loss of Cud.—Subscriber, Evansville, Ind.: This is from loss of appetite, from indigestion. As a tonic, give at night half a pound of glauber salts, powdered gentian half an ounce, caraway seed bruised one ounce, ground ginger half an ounce, mixed in warm gruel made from oatmeal and boiled up in water. Let the food be given very sparingly. Remove all food not eaten, and keep the manger clean. A lump of rock salt should be kept in the manger. Tempt the appetite with unusual food in small quantities.

Saddle Gall.—A gentleman in a riding school in New York has a remarkably fine riding horse that has so fine and delicate a skin that it is never free from saddle galls. When the pressure is removed by pads it is thrown on another portion of the back. After grooming every morning sponge the part of the back touched by the saddle with a strong decoction of white oak bark and alcohol. Three parts of the decoction to one of alcohol. See that the saddle fits and is snugly buckled. Try the changing of saddle.

Spavin.—Mr. Theodore Silver, Jonesville, Wis., desires to know how many kinds of spavin there are that cause lameness in the horse, and how to cure them. There are two kinds of spavins, "bog spavin" and "bone spavin." Both may produce lameness when there is much inflammation. Bog spavin is a soft swelling about the inside of the hock joint, while bone spavin is a disease or inflammation of the bony texture of the joint. Blistering affords the most promising results in either case. Rest is indispensable in the treatment.

Slipping Calf.—Mr. G., Bay Co., Mich., has a three-fourths bred Jersey and one-fourth Durham, seven years old, that slipped her calf by being chased by a colt. Since the first, several years ago, she has lost every other calf prematurely. She is now in calf. Remove or keep her from horses and unruly cattle. Feed roots at least once daily. If she loses this calf it will be best to fatten her for the shambles. Habit in animals is too strong, often, to be overcome. Breeding animals should not be allowed to become too fat.

Umbilical Hernia.—L. Selin, Essex Co., N. J.: The swelling referred to in the cow must be, from your description, rupture of the navel. A perfect cure is extremely doubtful. If a truss could be worn with a broad elastic bandage the intestine might be kept within the abdomen. But the annoyance and unsightly appearance would be so constant and great that it would be better to dry up the cow, fatten and slaughter her. In animals, hernia is not so liable to strangulation, inflammation and mortification and death as in the human subject.

Navel Hemorrhage in Calves.—"Dairyman," Herkimer Co., N. Y., has been recently troubled with several cases of bleeding from the navel in newly-born calves. And as he is raising his heifer calves from Suffolk half-bred cows he is anxious to prevent the loss from this unusual cause. Take a pledget of cotton soaked in a solution of per sulphate of iron, one dram to half an ounce of water. Cover it with a folded cloth, apply to the bleeding navel and hold it there by a broad bandage around the body of the calf. A piece of rubber webbing in the bandage will keep it tense.

Superfluous Teat.—J. Lovell, Auckland, New Zealand, has a heifer that has a "teat" growing out of her natural teat at right angles an inch and a half long. The best means of removing the abnormal growth is by tying, or strangulation. Take a piece of saddler's silk, wax it to prevent the knot from slipping, then tie it firmly close to the natural teat. It requires a firm hand. The knot should be a surgeon's knot. Get your physician to do it for you if you have no skillful veterinary surgeon within reach. It is no disgrace for any medical man to relieve the sufferings of any of our domestic animals.

Canker of the Ears of Dogs.—Mrs. M. S., Philadelphia, Pa.: Cleanse the ears internally by gently syringing. Afterward pour into the ears a teaspoonful of the following mixture, night and morning: Ferric alum one dram, olive oil six ounces. Dissolve the ferric alum in an ounce of water and put the whole in a two- or three-ounce phial. Shake thoroughly before dropping into the ear. Dogs are naturally feverish, and this should be abated by feeding but little meat. Cook beef and veal hocks in a large quantity of water and when done stir in corn meal to thicken. Give this once daily.

Unthrifty Colt.—Louis Barlow, Howard Co., Md., has a colt that looks unthrifty, has a rough, staring coat, has had bunches on his body. Has had hay and corn. Indigestion is probably at the root of the trouble. Give an aloes ball every two days until he has taken three. Feed a little good hay, and two quarts of ground oats in two quarts of wheat bran three times a day. Then every night give in the feed a handful of whole flaxseed and a tablepoonful of Glauber salts (Glauber is better, and less nauseous, for man or beast than Epsom salts) in the night feed. Keep a lump of rock salt in every animal's manger.

Glanders.—R. Dibble, Bucks Co., Pa.: In the chronic form, which is that commonly met with, is a filthy, contagious, and fatal disease that should be got rid of at the earliest possible moment. The sooner the afflicted horse is shot and buried the better for the owner and the community. The symptoms are comprised in a discharge of a thick sticky, often purulent matter, and bloody discharge from the left or both nostrils: swelling of the glands about the throat. The hardness and tenderness of these glands comes and goes. This indicates a corruption of the blood. Keep your horse separated from the others and send for a veterinarian, and follow his advice.

Polypus in Nose of Cow.—K. T. K., Brooklyn, N. Y., has a cow that has always had a good appetite until she had spells of sneezing, watery eyes and hard breathing. For a long time the cow breathed with difficulty through one nostril. After a time this was entirely relieved, and she breathed as naturally as the other cows. Then he noticed some difficulty of breathing when the cud was returned to the mouth, causing choking. He desires to know what ails the cow. This is in all probability, though very rare, a polypus of the nares falling back into the throat. Send for a veterinarian and he will twist it off if he finds our suspicion correct.

Consumption in Milch Cows.—S. Ringer, Quebec, Can.: Cows of a delicate constitution suffer most from consumption. Dark, damp, crowded stables, and low wet pastures predispose to consumption in milch cows. In-and-inbreeding, long and severe milking, and little rest from breeding, also predispose to tuberculosis of cows. Low box stalls, either kept scrupulously clean, or profusely littered, so that all the solid and liquid manure is absorbed and thickly covered are the stalls best for milch cows to keep from getting consumption in. If either condition emits offensive odors, or the cows get filthy, the first is not clean or the latter is not properly littered. Give only good sound food and fodder.

The Veterinary Profession.—H. G. B., Lehigh Co., Pa., writes us: "What are the chances for a young man with moderate means to engage in the veterinary profession? Is not this business being overstocked?" The veterinary profession is as honorable and promising a calling as any young man can follow. Instead of having an overstock of veterinary physicians and surgeons there is a greater scarcity of them in the country than in any other profession. There is an overstock of so-called "Horse Doctors" who do not know as much about the proper management of animals as most intelligent farmers do, and whose business ought to be stopped, but of well educated, scientific and skillful veterinarians there is not one for every hundred that are needed.

Dog Distemper.—D. Mueller, New York: A Newfoundland dog eight months old ill of distemper was doctored with Fowler's cure and recovered, but subsequently became paralyzed behind and had chorea. Then he was dosed with strychnine and iron and his back rubbed with Glover's liniment, but without effect. "Can the dog be cured, and what can be done?" Distemper among young dogs is not uncommon, but from its attack most recover. Those that suffer most are the highly bred, the overfed, the constitutionally weak, and the too-well-cared-for. While distemper seems to be a disease of the mucous membranes, the lungs, heart, liver, kidneys and nervous system may also be affected. Dogs neither get nor require as much care as people when ill, but do require a certain amount of doctoring and nursing. If their owners are kind and well-to-do, they receive the best of each, but the majority are left when ill to their fate. As with people, so with canines, even the best of care will not always bring them back to health. So long as no serious symptoms arise the patient is to be left alone, while the disease runs its course, in a dry, warm, clean and well-aired but not draughty place, with a dish of fresh water near by. As a rule, no food will be taken for a time, and if refused should not be forced upon the patient for the first few days. If the dog be valuable or prized he should have the services of the trained veterinarian at least as soon as urgent symptoms develop. The discharges should be cleaned from the eyes and nose night and morning. If the dog is constipated soap enema may be given early in the disease. Constipation should be expected later as a result of the prolonged fever and fasting. A mild fever mixture will serve to reduce temperature somewhat. Sweet spirits of nitre, one-half ounce, compound tincture gentian, one-half ounce, mint water, one and one-half ounces. Mix and give a teaspoonful for terriers, a dessertspoonful for a medium sized dog every three hours, diluted with an equal quantity of linseed tea. In recovery the patient may refuse to eat, then force him to take punch made of whiskey, milk and eggs; meat balls made of finely chopped meat or meat broths. The punch should be given three times a day at first, perhaps a tablespoontul only, afterward gradually increasing the dose, and later any of the crackers or puddings that dogs are usually fed. If the eyes continue weak and watery drop some of the following into them: Alum, five grains; water, one ounce. Stronger remedies cannot be advised, for their use depends on the condition of the patient at the time administered. While most patients convalesce rapidly, others will be weak in this or that organ for a long time, and some, though they tenaciously hold to life, never recover from the effects of the disease.

VICTORY

Yes, Victory is ours, and the Buggy and Harness "POOL and TRUST" men are *VERY SICK* because we have completely knocked them out by our straight forward way of doing business, and by selling our popular and world-renowned

"MURRAY"

$55.95 BUGGIES AND $5.95 HARNESS

DIRECT TO THE CONSUMER for less money than they can make them, let alone sell them. They and their agents have been saying all manner of things against us, but they now see that they have made a flat failure of it, and that they CAN'T KEEP A GOOD THING DOWN.

They have been used to asking
$75 to $100 for Buggies Not as Good
by any means as our Celebrated
$55.95 MURRAY BUGGIES
and from **$9** to **$12** for Harness that DON'T COMPARE with our **$5.95** HARNESS.

It was hard for them to give up their snap, but the people of the United States have fast become educated to the superior qualities of the "MURRAY" Buggies and Harness, and their hearty support in the last year has enabled us to sell **Three Times as many of our "Murray" Buggies and Harness as any one Factory in the World.**

WE HAVE MANY IMITATORS

but no competitors. Of course, a firm doing the immense business we do, can not help having imitators spring up all around them, but this only increases our business, and we can only say to the thousands who are using and who intend to use our "MURRAY" BUGGIES AND HARNESS,

BEWARE OF IMITATORS

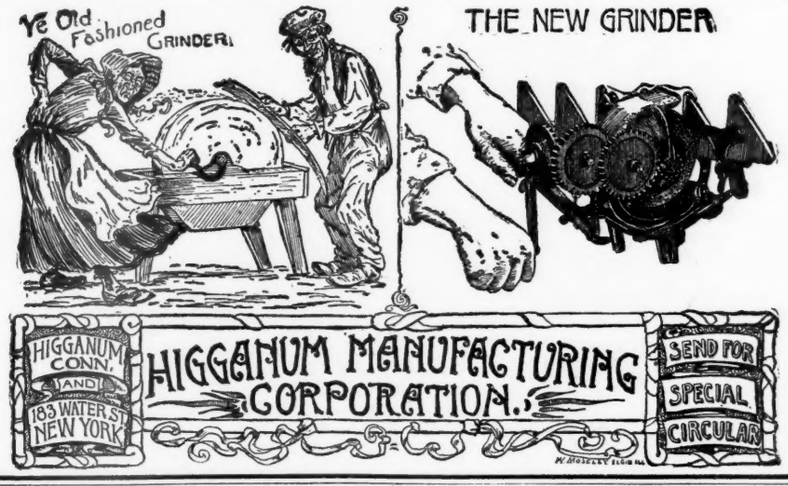
and persons and firms claiming to sell you Buggies and Harness as good and cheap as the "MURRAY," for they can not, and their goods lack the peculiar **Lasting Qualities and Fine Finish** of the

World-Renowned MURRAY Buggies and Harness.

Many Firms Make Big Claims, BUT WE PROVE OUR WORDS BY DEEDS AND WILL WAGER $1000 (One Thousand Dollars), with any Carriage and Harness Firm in the United States, same to be given to any Charitable Institution by the loser, that we can show more honest and better testimonials for the "MURRAY" Buggies and Harness for the time our goods have been on the market, than any one Factory in the World.

THIS IS A BIG ASSERTION everybody knows, and we are fully prepared to meet it. Everybody is well acquainted with the world-wide fame of the "**MURRAY**" **$55.95 Buggies** and **$5.95 Harness**, hence it is useless for us to dwell on their merits, as it would take this entire paper to tell of their many superior qualities. ☞ If you have not received our LARGE ILLUSTRATED CATALOGUE AND BOOK OF TESTIMONIALS write at once. We will mail it **FREE.** Address all letters to

WILBER H. MURRAY MFG. CO., Murray Building, 139 W. Front St., Cincinnati, O.


Ye Old Fashioned GRINDER!
THE NEW GRINDER
HIGGANUM CONN. AND 183 WATER ST. NEW YORK
HIGGANUM MANUFACTURING CORPORATION.
SEND FOR SPECIAL CIRCULAR

IT IS "HOG TIGHT"

and will keep all four-footed intruders off your Lawn. HARTMAN'S STEEL PICKET FENCE does not conceal the shrubbery, but beautifies and adorns any home it surrounds.

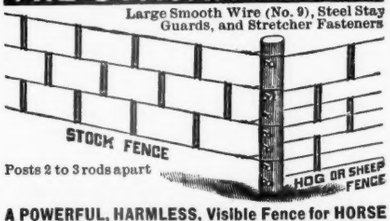
We sell more Lawn Fencing than all other manufacturers combined because it is the HANDSOMEST and BEST FENCE made, and CHEAPER THAN WOOD.

Our "Steel Picket" Gates, Tree and Flower Guards, and Flexible Steel Wire Door Mats are unequaled. A 40 page illustrated catalogue of "HARTMAN SPECIALTIES" mailed free. Mention this paper.

HARTMAN M'F'G CO.,
WORKS: BEAVER FALLS, PA.
BRANCHES: 102 Chambers St., New York, 508 State St., Chicago, 73 South Forsythe St., Atlanta, 1416 West Eleventh St., Kansas City.

THE DUNCAN FENCE.

Large Smooth Wire (No. 9), Steel Stay Guards, and Stretcher Fasteners



A POWERFUL, HARMLESS, Visible Fence for HORSE PASTURES, FARMS, RANGES AND RAILROADS.
You can build any height, and, by using Hog or Sheep Guards, as close as you wish.
WIRE FENCE IMPROVEMENT CO.
87 TO 91 THIRD AVE. CHICAGO.

Lifts 20 to 50 Tons, Worked by 2 men, 5 sizes. **Price, $35 to $70.** Circulars Free. ☞ Sent on **Three Days Trial.** H. L. Bonnett, Westerville, O.

"Down With High Prices."
SEWING MACHINES
FROM $40 TO $10!
Prices Lower than the Lowest on Buggies, Carts, Sleighs, Harness. $5.00 Family or Store Scale, $1.00 A 240-lb. Farmers' Scale.... 3.00 Farmers, do your own Repairs. Forge and Kit of Tools.... $20.00 1000 other Articles at Half Price.
CHICAGO SCALE CO., Chicago, Ill.

When writing to advertisers, be sure and mention the AMERICAN AGRICULTURIST.

We sell at WHOLESALE PRICES
BUGGIES, CARTS & WAGONS.

CAN SAVE YOU Over 30 per Ct.
Any vehicle shipped subject to examination before paying one cent. What more can you ask? Send 2c. stamp for illustrated 48-page catalogue and price list.
COLUMBIA BUGGY CO., 71 to 81 Willard St., Kalamazoo, Mich.

OUR LIBRARY CORNER.

(*Continued from Page 306.*)

sidered, and, as the author is high authority on the subject, vineyardists need not hesitate to follow his directions. Nine diseases of the grape are thus elaborated. Next come the diseases of the apple, pear, quince, plum, cherry, peach, and raspberry. All the subjects discussed have been beautifully illustrated with drawings from nature by the author and they serve well the purpose of giving the reader an intelligent idea of the appearance of these minute yet terribly destructive parasitic plants. Both author and publishers have performed their work well, and every vineyardist and orchardist who fails to secure a copy of this treatise for daily reference will "miss it" when he comes to gather his fruits next fall. Sold by the Orange Judd Co., paper fifty cents, cloth, seventy-five cents.

THE NEW POTATO CULTURE as developed by the Trench system, by the judicious use of Chemical Fertilizers, and by the experiments carried on at the Rural Grounds during the past fifteen years. By Elbert S. Carman. 12 mo.; pp. 165; The Rural Publishing Co., New York.

On the one-acre garden plat in Bergen county, New Jersey, known as the "Rural Experiment Grounds," the author of this work has for several years carried on a series of experiments with potatoes, testing new varieties, and studying their characteristics and requirements. The principal aim has been to ascertain the modes of planting, cultivating and manuring, by which the largest and most profitable uniform yields could be obtained. As the result of these investigations the "Rural Trench System" was finally adopted as the most satisfactory method. The various styles of its developments, failures and successes are here minutely described. The results of the experiments with different fertilizers on potatoes are of special interest to potato growers whether the Trench System is adopted or not. Other chapters are devoted to the application of fertilizers under or over the seed pieces; different depths of planting; size of sets; analysis of tubers and vines; raising seedling potatoes; digging and storing; and many practical hints of interest and value to potato growers. Sold by the Orange Judd Co. Price, cloth, seventy-five cents; paper, forty cents.

HOME FLORICULTURE. A Familiar Guide to the Treatment of Flowering and other Ornamental Plants in the Home and Garden. Illustrated. By E. E. Rexford. 12mo. pp. 226. James Vick, Seedsman, Rochester, N. Y.

A book devoted exclusively to amateur floriculture will, no doubt, be welcomed by vast numbers of flower lovers who desire to beautify their homes and grounds with flowers and plants, without incurring a very great expense. The author is a thoroughly practical, although not professional, floriculturist, fully understands the needs of amateur gardeners, and in this volume has given them just the information they are most in need of, and as he has learned it from his own experience. The general management of plants in regard to soil, potting, watering, propagation, fertilizers, etc., etc., is given in very clear and popular style without any unnecessary technicalities which are so apt to bewilder the beginner. All the most desirable old and new varieties of flowers and ornamental plants which can be grown in the home, window, and garden are described, together with the best and easiest method of growing them with success. For sale by the Orange Judd Co. Price $1.50.

SEVENTH BIENNIAL REPORT OF THE KANSAS STATE BOARD OF AGRICULTURE, for the years 1889, 1890: pp. 260.

This report is well up to the high standard adopted by the State Board. Besides treating exhaustively the subjects of loco-weeds, the smuts of wheat, oats, and corn, the chinch-bug, etc., it contains descriptive statements, statistics, and general information relating to each county and the geographical and the topographical features of the State, together with tables, statements, summaries, and diagrams, showing the products, progress, and development of the State.

THE POULTRY DOCTOR, including the Homœopathic Treatment and Care of chickens, turkeys, geese, ducks, and singing birds; also a Materia Medica of the chief remedies. 12 mo.; pp. 85, cloth; Boericke & Tafel, Philadelphia.

While the greater part of this work is devoted to the homœopathic treatment of poultry diseases, and to a *materia medica* of the chief remedies recommended, the chapters devoted to the hygienic treatment, and the sanitary and dietetic management of poultry are of special value to beginners in poultry raising. There is no theorizing about all this, every sentence conveys a practical truth, and was evidently written by one who has had large experience with poultry. To those who do not believe in the efficacy of homœopathic medicines, these practical directions alone will be worth the price of the book. Sold by the Orange Judd Co. Price fifty cents.

Ayer's Pills

May always be relied upon as a certain cure for liver troubles, constipation, sick headache, biliousness, dyspepsia, jaundice, and rheumatism. Unlike most cathartics, Ayer's Pills strengthen the stomach, liver, and bowels, and restore to these organs their normal and regular action. Taken in season, they check the progress of colds, fevers, and malaria. Being purely vegetable and sugar-coated, Ayer's Pills are

The Favorite

family medicine, while travelers, both by sea and land, find them to be indispensable.

"We sell more of Ayer's Pills than of all other kinds put together, and they give perfect satisfaction."—Christensen & Haarlow, Druggists, Baldwin, Wis.

"I have used Ayer's Pills for the past thirty years, and consider them an invaluable

Family Medicine

I know of no better remedy for liver troubles and dyspepsia."—James Quinn, Hartford, Ct.

Capt. Chas. Mueller, of the steamship "Felicia," says: "For several years I have relied more upon Ayer's Pills than anything else in the medicine chest, to regulate my bowels, and those of the ship's crew. These Pills are not severe in their action, but do their work thoroughly. I have used them, and with good effect, for the cure of rheumatism, kidney troubles, and dyspepsia."

Ayer's Pills

PREPARED BY

Dr. J. C. AYER & CO., Lowell, Mass.

Every Dose Effective.

Do You See THE POINT?

ALTHOUGH

Originated by an Old Family Physician in 1810, Johnson's Anodyne Liniment could not have survived for over eighty years unless it possesses extraordinary merit.

UNLIKE ANY OTHER

As much

For INTERNAL as EXTERNAL use.

It is Soothing, Healing, Penetrating. Once used always wanted; and dealers say "Can't sell any other."

Every Mother Should have JOHNSON'S ANODYNE LINIMENT in the house for Croup, Colds, Sore Throat, Catarrh, Tonsilitis, Colic, Nervous Headache, Cuts, Bruises, Cramps, Pains, Relieves Summer Complaints like magic. Sold everywhere. Price 35 cents, 6 bottles, $2.00. Express paid. Pamphlet free. I. S. JOHNSON & CO., Boston, Mass.

Do You Suffer with Piles? You can cure yourself in a few days with our new and simple method of treatment. Medicine easily used and gives immediate relief. Special treatment and large package of Cure $2. A trial order $1. Send a stamp for little book "How to Cure Piles." We will cure you or return your money. No humbug. **THE GLOBE MEDICINE CO.,** Box 723, **Cincinnati, O.**

Piso's Remedy for Catarrh is the Best, Easiest to Use, and Cheapest.

CATARRH

Sold by druggists or sent by mail. 50c. E. T. Hazeltine, Warren, Pa.

THE NEW MODEL, OUR LATEST and BEST MOWER.

For simplicity, durability and quality of work, it is unequalled, while for lightness of draft it excels by a large percentage any other Lawn Mower made. Send for circular and price-list.

CHADBORN & COLDWELL MANUF'G CO., NEWBURGH, N. Y.

ROBERT C. REEVES CO.,

MANUFACTURERS AND DEALERS IN

Agricultural Implements, Dairy Fixtures, Seeds, Fertilizers, etc.

The **"NEW MODEL"** and **"EXCELSIOR"** Horse and Hand Lawn-Mowers are the best.

A complete stock of all sizes always on hand.

Send for illustrated Catalogue.

185 and 187 Water St., New York City.

1851. INSURE WITH 1891.

The Massachusetts Mutual

LIFE INSURANCE CO.,

SPRINGFIELD, MASS.

Massachusetts Laws protect the policy holder. Send for rates, circulars, etc.

Look!

WATERPROOF STACK COVERS: HAY CAPS.

Plant Bed Cloth, Wagon Covers, Agricultural Implement Covers, &c.

For Circulars and Samples, address

NATIONAL WATERPROOF FIBRE CO.,

27 South Street, New York, N. Y.

OUT OF PAPER?

If so, and you wish to obtain the leading papers of the day, when purchasing, ask your stationer for, and insist on having

BOSTON LINEN *(for society correspondence).*
BOSTON BOND *(for foreign correspondence).*
BUNKER HILL *(for every-day correspondence).*

These papers have gained an unprecedented reputation in every State and Territory on account of their excellent quality and reasonable price. If your stationer does not keep them, and will not get them for you, do not accept any others, but send us your name, mentioning "American Agriculturist," and we will forward you our complete set of

SAMPLES FREE!

We send full information as to price, styles, size, etc., also samples and price of stamping your initial, monogram, crest, coat-of arms, street address, etc., upon the paper.

SAMUEL WARD COMPANY,
49 & 51 Franklin St. Boston, Mass.

PRINTING For Poultry and Stock Fanciers, Beekeepers, Nurserymen, Florists, Dairymen, Fruit Growers, Farmers, etc., a specialty. We have a large line of electrotype cuts for illustrating your work. Samples free. Cuts for sale. Envelopes, letterheads, cards, and tags from 40 cts. per 100 and up. **DePuy's Electric Printing Works, Syracuse, N. Y.**

When writing to advertisers, be sure to mention the AMERICAN AGRICULTURIST.

"FOSTER" $45.25 BUGGIES

OUR $37.50 ROAD WAGON.

"FOSTER" $5.25 HARNESS

Read carefully and consider! Now that you and other people have been looking for a GRAND OPPORTUNITY to spring up, Stop and Hear Us! The wonderful success that has attended the sale of the "FOSTER" $45.25 Buggies and $5.25 Harness all over the country stamps us as the LEADER IN LOW PRICES AND GOOD WORK. We sell more of the celebrated

100,000 FOSTER BUGGIES $45.25 HARNESS $5.25

DIRECT TO THE CONSUMER than all other manufacturers combined, because they are the Handsomest and Best Buggies and Harness in the market for the money. We are not in any Pool or Trust Combination, but sell Direct to the Consumer at Factory Prices, and give a guarantee with all the "FOSTER" Buggies and Harness sold. Our experience has been: "A customer once secured is a customer forever."

BOOMING!!

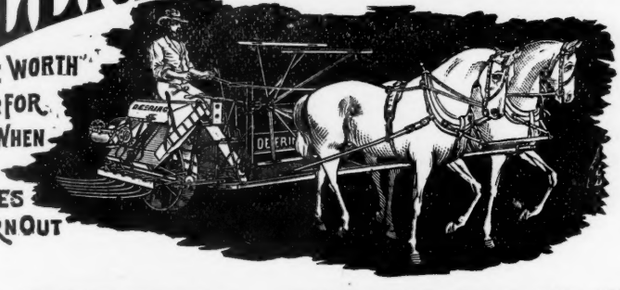
Yes, we want this month to be the largest and booming month we have ever had, and at these LOW PRICES we are sure to do it.

Act Quick! The Early Buyer Reaps the Best Bargain!

Our Illustrated Catalogue, with its valuable contents, and prices that will surprise you, will be sent free on application. Do it NOW, before the rush is on. Special arrangements made with the FARMERS' ALLIANCE. Address all orders to

THE FOSTER BUGGY & CART CO., 77 W. Fourth St., Cincinnati, O.

DEERING JUNIOR STEEL BINDERS



ARE WORTH DOLLAR FOR DOLLAR WHEN OTHER MACHINES ARE WORN OUT

NEW GIANT JUNIOR GIANT **DEERING MOWERS** SAVE GRASS THAT OTHERS LEAVE.

FLOWER BRANDS **DEERING BINDER TWINES** SUIT EVERY PURSE AND EVERY TASTE

For Sale Everywhere. For Copy of "Whys and Wherefores" by Therefore Do So, Esq. write to **WM. DEERING & CO.** CHICAGO. U. S. A.

DO YOU WANT A **Profitable Business?** Do you wish to SUCCEED where others fail? Then

BORE WELLS

with our famous Well Machinery. The only perfect self-cleaning and fast-dropping tools in use.

THE GREAT "OHIO" WELL DRILL

LOOMIS & NYMAN, TIFFIN, OHIO. Catalogue FREE.

"GET THE BEST"

THE Blanchard DAIRY GOODS

MADE ONLY BY

PORTER BLANCHARD'S SONS CO.,

Now located at NASHUA, N. H.

SPECIALTIES: Factory and Family Churns and Butter Workers, Butter Packages, Molds, Carriers, Milk Testers, Thermometers, &c., &c., &c. We make or furnish everything needed in a Butter Factory or Family Dairy.

IT IS CONCEDED that our goods combine more desirable qualities than any other make or kind. Don't be fooled by representations to the contrary. Stick to a SURE thing.

Send to our new address for descriptive circulars. Inquire for anything you need. We can furnish it.

GET THE BEST.

THE PEOPLE'S KNITTING MACHINE.

Retail Price only $5.00. Will knit Stockings, Mitts, Scarfs, Leggings, Fancy-work, and everything required in the household from homespun or factory yarn. Simple and easy to operate. Just the machine every family has long wished for. Send $2 with your order; I will ship machine, threaded up, with full instructions, by express C. O. D. for balance, $3, when machine is received. Large commission to agents. Circular and terms free. Address J. E. GEARHART, Clearfield, Pa.

HEEBNER'S Patent LEVEL-TREAD HORSE-POWER.

With SPEED REGULATOR. For 1, 2 and 3 Horses.

Catalogues Free.

LITTLE GIANT Threshing Machine. Threshes Grain, Rice, Flax, Millet and Grass Seed. Fully Warranted. Feed and Ensilage Cutters, Feed Grinders, &c. *HEEBNER & SONS, Lansdale, Pa., U. S. A.*

EVERYBODY THEIR OWN ROOFER.

Anybody can apply these shingles. They are durable, fireproof and handsome. This system of roofing has advantages over all other methods. For full particulars, testimonials and prices, address the manufacturers.

W. J. BURTON & CO., Detroit, Mich.

Mention this paper.

MATTERS OF BUSINESS.

Bright Prospects Ahead.

The April returns to the United States Department of Agriculture make condition of winter wheat 96.9, and of rye 95.4, while 100 represents a full average stand.

The season for seeding was favorable over the whole winter wheat area; the soil was generally easily worked, the seed bed prepared with unusual care, and sowing followed by gentle rains, sufficient to properly pack the earth and insure prompt and perfect germination. On portions of the Atlantic and Gulf coasts the time of seeding was somewhat prolonged by occasional rains, but the delay was not serious, and the desired area was planted and in good growth by the advent of winter. Suitable weather and soil conditions enabled farmers of the Ohio Valley States to put in a full breadth under entirely favorable circumstances, and proper combinations of sunshine and moisture which continued until cold weather sent the plant into winter quarters with sturdy growth and good color. In portions of Kansas and Nebraska the prolonged drought of last summer extended into the period of seeding, interfering somewhat and rendering germination slow, but seasonable weather during the late fall and early winter was sufficient to offset the disadvantage of a late start. The entire season was favorable in California, while in Oregon a dry seed bed received moisture in time to secure good though late growth.

The weather was generally mild over the whole area, and while the snowfall was comparatively light it came when most needed, protecting the plant during the coldest weather.

The Ohio Valley and trans-Mississippi States were especially favored, growth in many sections continuing throughout the winter, with sufficient covering when needed and an entire absence of damage from freezing and heaving. Brown and bare spots are seldom met with, growth and color being remarkably uniform.

The Hessian fly which was feared in December in the central West is yet in abeyance, but the presence of the pest is noted in many localities, and serious injury might follow should the early season prove favorable to its development.

The general average for condition is the highest reported for April since 1882, and the individual State averages are remarkable for their uniformity. It is sixteen points higher than last year, and three above the returns for 1889. A high April condition does not insure a large yield, but it indicates a strength and vitality which would enable the plant to withstand more than the ordinary vicissitudes of the season. The nearest approach to present condition during recent years, was in 1884, when the largest crop ever grown was harvested, but similar high condition in 1886 was followed by a crop of little more than average proportions: The averages of condition in the principal States are:—New York, 92; Pennsylvania, 97; Tennessee, 98; Kentucky, 97; Ohio, 98; Michigan, 93; Indiana, 99; Illinois, 97; Missouri, 96; Kansas, 99; California, 99; and Oregon, 97.

The returns make the percentages of losses among farm animals during the past year, of horses, 1.7; cattle, 3.0; sheep, 4.0, and swine, 8.4. Horses receive better care than any other class of stock, and annual losses vary but little. The percentage of loss of cattle is slightly higher than was reported in 1888 and 1889, the scarcity of feed swelling the figures in portions of Kansas and Nebraska. The losses of sheep have been smaller than usual on account of better care and attention, while less disease than usual is reported among swine, though there is heavy loss in the regions of last year's crop failures.

Note and Comment.

Census Bulletins.—Summaries of the results obtained in the different branches of the census are published in the form of bulletins. Persons interested can obtain the bulletins on special subjects free by applying to Hon. Robert P. Porter, Superintendent of the Census, Washington, D. C.

The Garry Iron and Steel Roofing Co., located at 152-168 Merwin street, Cleveland, O., reports an exceedingly fine trade for this time of the year, and that they have a large number of orders ahead, some of which are for May and June deliveries. They are exporting their goods very largely to Mexico, South America and other foreign ports, and recently received an order from St. Petersburg, Russia, for their celebrated Continental Metallic Shingle, also from South America for a large quantity of corrugated galvanized iron.

The Japanese Insect Destroyer.—A new Insecticide is offered by the Friend Medicine Co., Gresham, Neb. It is to be applied before the insect enemies make their appearance, and is worthy of a trial.

A Salary with expenses paid will come handy to any one who is now out of employment; especially where no previous experience is required to get the position. If you want a position, see advertisement on Page 306, "A Chance to Make Money."

Massachusetts Horticulture.—The Rose and Strawberry exhibition of the Massachusetts Horticultural Society will be held on June 23 and 24 in Horticultural Hall, Boston. The aggregate prizes for the exhibition offered this year by the society amount to $6,800.

A Yankee Fence.—We are informed that the ingenious fence described and illustrated in our March number, under the name of "A Yankee Fence," is patented. The patentee is Mr. M. Bailey, Braceville, Trumbull Co., O., who will gladly answer any question in regard to it.

A Type of Modern Development.—The North Shore Limited, the only afternoon "Limited" train out of New York for points West, leaves Grand Central Station at 4:50 P. M. every day, typical in all departments of the highest development of railway service. Entire train equipped with new Wagner perfected vestibule.

A New French Veterinary Remedy.—Gombault's Caustic Balsam is the name of a new Veterinary Remedy which is highly recommended by regular veterinarians as a vesicant, and especially for external application in throat diseases of animals. Lawrence, Williams Co., Cleveland, O., are the sole Importers and Proprietors.

The Wagner Perfected Vestibule on all Express Trains of the New York Central.—The New York Central maintains a service of eight magnificent express trains West every day in the year, including its three famous "Limited" trains. A conspicuous feature of this service is the perfected Wagner vestibule, the superiority of which to all other vestibuling devices is incontestible. A trial will clearly demonstrate this.

Reliable Fencing.—The rapidly increasing demand for the Sedgwick Fences and Gates, manufactured by the Sedgwick Bros. Co., Richmond, Ind., has made it necessary to establish an Eastern Agency, at 300 Market street, Philadelphia. The agent is Mr. Edward Sutton, who will attend to all business as promptly as can be done from the main office.

Improvements in Currycombs.—That the old-style Currycomb is far from perfection is undisputably recognized by groom and horse as well, and any solid improvement in this important stable furniture will be gladly welcomed by every horse owner. This is offered in the Spring Currycomb, for sale by the Spring Currycomb Co., South Bend, Ind., and, to judge from the many favorable recommendations it receives everywhere, it is all that is claimed for it.

Condition of the Wool Market—William McNaughton's Sons, extensive wool merchants, of New York, inform us that a more healthy tone to trade is noticeable everywhere. Many old mills which have been idle for years and new ones are starting up, thus creating a large and steady outlet for raw wool. The unusually small stock in all the wool centers of the country has reduced stocks, and is a safe guarantee that the spring clip of this year will find a ready market at the present good prices.

The Famous Seven-Dollar Palace Lounge.—Our readers will find in this issue the advertisement of the Palace Furniture Co., of Cincinnati, Ohio, who manufacture the famous $7.00 Palace lounge and $11.00 Bed lounge, and a full line of all kinds of household furniture. They sell their goods direct to the consumer, and are thereby enabled to sell at astonishingly low prices. Their illustrated catalogue contains full descriptions and net cash prices of their goods; it will be sent free to subscribers applying for it.

Comparative Merits of Fruits.—To those ordering Grapevines and Small Fruits from catalogue description there is nothing more puzzling than to ascertain the comparative merits of the various varieties. To facilitate this work as much as possible, the T. S. Hubbard Co., Fredonia, N. Y., gives in their catalogue concise tables of all the most popular varieties as to size of berry, cluster, table quality, time of ripening, hardiness, productiveness, shipping quality, etc., together with practical cultural directions.

Protection Against Grape Rot.—The great advantages of bagging grapes as a protection against rot, insects, and birds, are fully recognized by all intelligent grape growers. The principal reason why this method has not already found universal adoption has been the difficulty in finding the proper bagging material at a sufficiently low price to warrant its use. The Weather Proof Protectors manufactured by the Ohio Grape Protection Co., Ironton, Ohio, meet all reasonable requirements, and are sold so cheap that no vineyardist can afford to be without them.

A Noteworthy Anniversary.—The firm of S. H. Parvin's Sons, Cincinnati, O., have just celebrated their Fortieth Anniversary in the Advertising Business. The idea of conducting an Advertising Agency was original with Mr. S. H. Parvin, and from a small beginning the business has gradually grown to immense proportions. Through uniform fair dealing with their customers and a high standard of integrity, this firm has justly earned the respect and esteem of both publishers and advertisers. The AMERICAN AGRICULTURIST takes pleasure to extend on this occasion its hearty congratulations and best wishes for success to its friends S. H. Parvin's Sons.

One Thousand Threshing Outfits.—This is the annual capacity of the new plant of the Huber Mfg. Co., at Marion, Ohio. It covers thirteen acres of ground, and is provided with every known machinery and device for turning out first-class work as represented in the various specialties of the firm. The fact that there are over 2,000 Huber Boilers in use without ever an explosion having occurred is sufficient proof of their excellence, while the Huber Separator combines several points of superiority well worth the attention of those in need of a perfect Threshing Outfit. Full description of these are given in the catalogue, mention of which is made in our advertising columns.

Insects on Fruit Trees.—The cheapest and easiest method of ridding trees and vines of insect pests is by spraying with insecticides. Hence, pumps and outfits for this purpose become as necessary to the fruit farmer as his plow or cultivator. The Field Force Pump Co., of Lockport, N. Y., manufactures a full line of spraying outfits and machinery, including a superior Knapsack Sprayer. They have recently publishd a new catalogue containing valuable formulas and recipes, which will be sent free on application. It has been authoritatively stated that by using Field's Spraying Outfit the cost per tree for spraying was from two to five cents, while the estimated gain was from $2.50 to $4.00 per tree.

A Good Windmill is a boon on every farm and stock ranch. It is invaluable for irrigating the garden and orchard and for watering stock. When a fire breaks out its utility is doubly appreciated. The Decorah steel windmill, manufactured by the Goulds & Caldwell Co., Chicago, Ill., and the Decorah Windmill Co., Decorah, Ia., is one of the best windmills made. This mill is so constructed as to secure the greatest working power from the least exposure of surface to the wind, and with the lightest weight admissible for positive security and durability. The firms also manufacture an iron tower, which is strong, light and durable, as well as cheap. Parties desiring windmills should write to either of the above mentioned firms for further particulars.

Carriages and Harness at Manufacturers' Prices. In but few industries has there been such remarkable improvement and progress as in carriage building; yet no one who has not examined the large and handsomely illustrated Catalogue of the Elkhart Carriage and Harness Manufacturing Co., Elkhart, Ind., can have an idea for how little money real first-class wagons and harness of all descriptions can be obtained. The phenomenal success of this company is due not only to the excellence and cheapness of their wares, but to their system of dealing direct with their customers, thus saving to the buyer all commissions, and by assuming all risks themselves. If what is ordered is not satisfactory, the company takes it back, paying all charges. The catalogue makes interesting reading, and will be sent free to all readers of the AMERICAN AGRICULTURIST who may apply for it.

One-Third of a Century.—The percentage of business houses in New York city that can point to a successful and honorable career of thirty-three years is extremely small, and when we meet with such a concern we cannot but feel that their success is due in a great part to the quality of the materials they produce and the manner in which they treat their customers. The H. W. Johns Mfg. Co., of New York, well known as the manufacturers of Asbestos Materials, Liquid Paints, Roofing, etc., commenced the manufacture of their various well-known articles a third of a century ago, and the demand for their products has increased so steadily that nearly every year they have been compelled to extend their manufacturing facilities, and now have the most extensive and complete works in the world in their line of trade. The H. W. Johns Mfg. Co. have the reputation of making a liquid paint which is absolutely pure and contains no adulterations. The finest public and private buildings and most extensive structures in this country are decorated with these paints; among others the United States Capitol, at Washington, United States Light Houses, Life Saving Stations, Navy Yard, and other Government Buildings, the largest seaside and other hotels, as well as thousands of the better classes of dwellings everywhere. They make a specialty of "combination samples," and furnish upon application suggestions for appropriate shades for dwellings to be painted. Those interested in the subject should enter into correspondence with them, and will probably obtain from them many points of valuable information.

We act
liberally
and
honorably
with afflicted persons
and prove to their
satisfaction
that they have
NOT TRIED
ELECTRICITY
AS A CURATIVE
UNTIL THEY HAVE
WORN THE
PULVERMACHER
ELECTRIC BELT

This involves
proving
as well
that all other
belts and
appliances
are either
COLORABLE
IMITATIONS
or are ENTIRELY
NON-ELECTRIC.

We undertake
to do these things
and we cannot
afford to make any
misrepresentations.

This is in conformity
with our business policy
as PIONEERS
in the manufacture
of electric body-wear
—larger manufacturers
and dealers
than all other
concerns combined.

APPLY FOR PARTICULARS.

PULVERMACHER'S ELECTRIC BELT

CURES ALL NERVOUS, PAINFUL, AND WEAKENING DISEASES,

NERVOUS AND GENERAL DEBILITY, PHYSICAL WEAKNESS, TIRED FEELING, ALL NERVOUS COMPLAINTS, DYSPEPSIA, NEURALGIA, RHEUMATISM, FEMALE AILMENTS, STOMACH, LIVER, AND KIDNEY DISORDERS, &c., &c.

PULVERMACHER'S ELECTRIC BELT *Will Last for Years*—SAVING MUCH SUFFERING, WORRY, TIME, AND MONEY.

INTRODUCED IN ENGLAND, FRANCE AND GERMANY IN 1843; IN THE UNITED STATES IN 1876.

THIRTY-ONE AMERICAN AND FOREIGN PATENTS HAVE BEEN GRANTED, INCLUDING ALL LATE IMPROVEMENTS TO—**1891.**

INDORSEMENTS AND REPUTATION WORLD-WIDE. HONEST TESTIMONIALS.

☞*PRIVATE LISTS OF ADDRESSES OF FORMER PATIENTS CURED FIVE TO FIFTEEN YEARS AGO SENT TO EARNEST APPLICANTS FOR THE PURPOSE OF CORRESPONDENCE.*

DON'T WASTE YOUR TIME AND MONEY TRYING NEW-FANGLED MEDICAL NOTIONS; OLD-TRIED AND TIME-TESTED METHODS ARE THE BEST, SAFEST AND CHEAPEST.

WEIGH CAREFULLY THE VALUE OF TESTIMONIALS OF CURE OBTAINED FROM WEAK-MINDED OR NOTORIETY-CRAZED PERSONS WHO CRAVE TO HAVE THEIR NAMES AND "PICTURES" APPEAR IN THE NEWSPAPERS.

YOU RUN NO RISK WITH US. WE DO BUSINESS IN THE GOOD OLD-FASHIONED WAY--GIVING VALUE FOR VALUE. IT IS TO THE INTEREST OF SICK, WEAK, OR AILING PERSONS TO WRITE US. WE CAN BE OF SERVICE TO THEM.

Read the Following Unexampled Offer:

SAMPLE OF BELT SENT FREE.

We take pleasure in sending by mail to afflicted persons, who may be interested in our electric treatment, for home use, a FREE sample of the Pulvermacher Electric Belt. This sample enables patients to judge for themselves of its genuine electric character, and to see at a glance that it is different in every particular of construction, and in the materials used, from any of the so-called curative appliances which may have been brought to their notice.

We are the only manufacturers of genuine and durable Electric-Curative Appliances, and WE ALONE send FREE samples for examination. THESE SAMPLES ARE FULL SIZE (PERFECT FAC-SIMILES) AND CORRESPOND IN EVERY WAY WITH OUR CLAIMS AND DESCRIPTIONS.

WE DO JUST AS WE SAY.

The afflicted have been imposed upon to such an alarming extent by dealers in all sorts of so-called electric, magnetic, and voltaic belts and other appliances that it gives us pleasure to state that our plan of sending samples has been the means of forestalling further imposition upon afflicted persons by SATISFYING THEM BEYOND QUESTION that the Pulvermacher Electric Belt is the ONE and ONLY BELT suitable in every way for practical medical purposes.

The Sample of Belt is sent by return mail, secure from observation, to every ailing person on receipt of "Order for Sample" form below. It may also be had on application or on request by letter.

ORDER FOR SAMPLE.

[INCLOSE THIS ORDER WITH NAME AND ADDRESS IN FULL.]

Pulvermacher Galvanic Co., 172 Race St., Cincinnati, Ohio.

SEND ME BY MAIL, WITHOUT CHARGE, A SAMPLE OF THE PULVERMACHER ELECTRIC BELT, AS PROPOSED BY YOU.

NAME.....

TOWN.....COUNTY.....STATE.....

WITH THE *SAMPLE* WE MAIL A COPY OF "*THE ELECTRIC REVIEW*," A LARGE ILLUSTRATED JOURNAL, AND OUR "*GENERAL PAMPHLET*" OF 112 *PAGES*, CONTAINING FULL PARTICULARS OF THESE NOTED CURATIVE APPLIANCES. SPECIAL TESTIMONIAL PAMPHLET OF 68 PAGES, CONTAINING HIGH-CLASS TESTIMONIAL LETTERS DATED 1891, ALSO MAILED. FOR ALL OF WHICH YOU ARE NOT CHARGED ANYTHING.

Address PULVERMACHER GALVANIC CO., 172 RACE ST., Cincinnati, Ohio.

Preserve the above "ORDER FOR SAMPLE" or apply NOW, while you have our address before you as this offer appears in the papers only occasionally. Please mention The AMERICAN AGRICULTURIST. **Or 1164 BROADWAY, NEW-YORK.**

BEES AND HONEY.

Send to the **Largest Bee-Hive Factory** in the world for sample copy of **CLEANINGS IN BEE CULTURE** (a $1 illust'd semi-monthly), and a 44 pp illus. Catalogue of **BEE KEEPERS' SUPPLIES.** Our **A B C of Bee Culture** is a cyclopedia of 400 pp. and 300 cuts. Price $1.25

Mention this paper. **A. I. ROOT, Medina, O.**

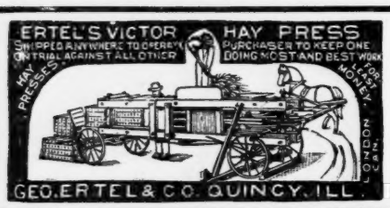
USE BOILING WATER OR MILK.

EPPS'S

GRATEFUL---COMFORTING.

COCOA

SOLD IN LABELLED 1-2 LB. TINS.



THE BEST CATTLE FASTENING!

SMITH'S

SELF-ADJUSTING SWING STANCHION!

THE only Practical Swing Stanchion Invented. Thousands in use. Illustrated circular free. Address,

F. G. PARSONS & CO., Addison, Steuben Co., N. Y.

GRIND YOUR OWN Bone, Meal, Oyster Shells, Graham Flour & Corn, in the **$5 HAND MILL** (F. Wilson's Patent), 100 per cent. more made in keeping Poultry. Also POWER MILLS and FARM FEED MILLS. Circulars and testimonials sent on application. **WILSON BROS.** Easton, Pa.

DAIRYMEN please send your address to **E. L. HILL,** West Upton, Mass., for 1891 Catalogue of **HILL'S MILK AERATOR** for freeing milk of odors of animal or feed, without use of **ICE or WATER.**

INDIAN GAMES, 15 eggs for $5; RED CAPS & GOLDEN WYANDOTTS, 15 eggs, $2. 26 83; B. MINORCAS, W. & L. WYANDOTTS, W. & B. P. ROCKS & HOUDANS, 13 eggs $1; 30, $2. Circular free. **A. LEIDA, Delaware, N. J.**

EGGS FOR HATCHING at prices to suit the times. Send two one cent stamps for 30 page fine Illustrated Catalogue. **C. C. SHOEMAKER,** Freeport, Ill.

BEEF SCRAP Send for sample and price-list *free.* Brooklyn Food Co., 133 Water St., N. Y. City.

WHAT! A 20-page Poultry Book. One full-page colored plate for a 2-cent stamp? Yes. **G. M. T. Johnson,** Box 3, Binghamton, N.Y.

The Poultry World. The best poultry paper. $1.25 per year. Send one dime or five 2c stamps for sample copy. Address H. H. Stoddard, Publisher, Hartford, Ct.

EGGS AND FOWLS FOR SALE From 50 Varieties. Largest Range in the West. My fowls won over 800 first and 2nd prizes at 7 State shows last fall. For full description send three one-cent stamps and get the finest illus'd catalogue out, 8x11, 32 pages. **CHAS. GAMMERDINGER, COLUMBUS, O.**

SWARMS---Send eight 1-cent stamps for a 24-page pamphlet on Taming and Handling Bees, or send your address for free samples of bee-veils and comb-foundation, and circular of bee-book, smokers, etc., to **DADANT & SON,** Hamilton, Ill.

PIGS, Chesters, Berkshires, Polands, Fox Hounds, Beagles, Collies, Setters. **GEO. B. HICKMAN,** West Chester, Pa. Send stamp for Circular.

MICHIGAN FARMS Rich Soil, Big Crops, and a near market enables farmers to make **Large Profits.** Long time, low rates and small payments. **O. M. Barnes,** Land Commissioner, LANSING, MICHIGAN.

WASHINGTON WHAT Uncle Sam and Aunt Columbia think, etc., of and Seattle. Send stamp to Eshelman, Llewellyn & Co., Seattle, Wash.

INVESTORS

Should get information about our **Guaranteed**

Mortgages

Bonds PAYING **6%**

Stocks **8½%**

10%

WE HAVE HAD

20 Years' Experience

IN INVESTMENTS.

Never Lost a Dollar

In every instance Interest and Principal has been paid at maturity.

WE HAVE RETURNED TO INVESTORS

$13,000,000

realizing 5 per cent. to 12 per cent. interest.

We never handle any security that we do not absolutely control. The investments we now have are as secure as any we have ever offered, and pay **more interest** than any we have offered in the last ten years. We can refer to the leading banks in New York, and to our 4,000 patrons. We are under the supervision of the Banking Department of New York State.

J. B. WATKINS L. M. CO.

319 Broadway, New York.

HENRY DICKINSON, Manager.

COME SOUTH!

DO YOU WANT A HOME?

IF SO READ THIS.

For $500 you can obtain from us 80 acres of land, a comfortable two-room house upon it, and twenty acres fenced. The land will be located either in **Alabama or Mississippi,** within two miles of the line of the **Mobile & Ohio Railroad,** in a dry and healthy locality. Pure freestone water. Land will produce corn, cotton, tobacco, rice, sugar-cane, potatoes, oats, rye, all fruits and vegetables suitable to our climate, and many tropical products. Mean temperature for month of July, 1890, (warmest month) 80.5 degrees. Mean temperature for December, (coldest month) 54.1 degrees. Mean temperature for the year 68.3 degrees.

700,000 Acres of Mobile & Ohio Railroad lands for sale in tracts to suit purchasers.

750,000 Acres of United States Government land open to Homestead entry and pre-emption.

Round Trip Land Seekers' Tickets for sale in Chicago and St. Louis to all points on the line of the Mobile & Ohio Railroad at Low Rates. These tickets permit their holders to stop off at pleasure south of the Ohio River, and are good 40 days after date of sale. For further information in regard to rates address **G. W. KING, Gen'l Passenger Ag't, Mobile, Ala.** For information in regard to lands address **ALABAMA LAND & DEVELOPMENT CO.,** or **HENRY FONDE, President, Mobile, Ala. Maps, Pamphlets and full information mailed free.**

VIRGINIA,

ALBEMARLE COUNTY.

The great fruit and grain growing section of the State. Winters mild and short. Scenery beautiful. Health fine. Near the great markets.

Land Good! Prices Cheap! Taxes Low!

Farms and City property for sale. Write to

L. D. AYLETT & CO.,

or Mayor of City, Charlottesville, Va.

FREE Illustrated Publications, with **MAPS,** describing Minnesota, North Dakota, Montana, Idaho, Washington and Oregon, the **FREE GOVERNMENT AND CHEAP NORTHERN PACIFIC R. R. LANDS**

Best Agricultural, Grazing and Timber Lands now open to settlers. Mailed FREE. Address

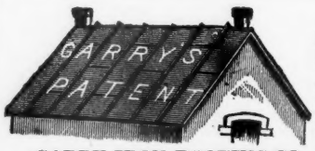
CHAS. B. LAMBORN, Land Com. N. P. R. R., St. Paul, Minn.

Grand Bargains in E. Tennessee Town Lots

Helenwood, 500 population, six passenger trains daily, soon be county seat, cheap fuel, excellent climate, fruit and gardening, properties doubling in value quickly, 1-4 acre lots only $30. Price higher next month. Buy in time. For full description, address

DAVID LOGAN, Meadville, Pa.

FOR SALE A BLUE GRASS FARM containing 600 acres; has 2 dwellings and 4 large barns; will make a fine Stock Farm; for terms apply to **E. B. YATES, Georgetown, Ky.**



We will furnish the most economical roofing and siding, all styles. Also Metallic Shingles from Iron or Steel with full directions and low prices.

GARRY IRON ROOFING CO., Cleveland, O.

Mention Agriculturist.

The Farmers' Choice Iron and Steel Roofing.

THE best made and lowest in price. Easily applied and suitable for all buildings. Qualities the very best, also Corrugated Iron, Crimped edge, etc.

SYKES IRON & STEEL ROOFING CO. NILES, O., and CHICAGO, Ill.

Write for Catalogue and Prices.

ENSILAGE

The **SILO** is rapidly being adopted in all sections of the U. S. and portions of Canada as the cheapest possible means of harvesting and feeding the corn crop; no waste, no husking, no grinding, no toll to pay, nor time to lose, and a reserve of green feed for all seasons of the year when pasturage and other crops may fail. Double the number of stock can be kept on the same number of acres under cultivation.

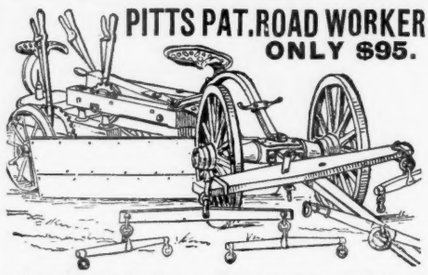
Our Catalogue embraces valuable information and detailed instructions on the subject, as well as description and prices of the FAMOUS

"OHIO"

Ensilage and Fodder Cutters

THE SILVER MFG. CO., SALEM, Ohio.

PITTS PAT. ROAD WORKER ONLY $95.



Stood Test of 6 Years. Cheapest, most reliable and best made Four-Wheeled Road Worker in the world. Send for circular to

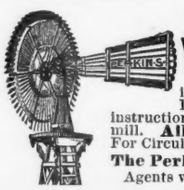
PITTS THRESHER WORKS, Joliet, Ill.

Mention this paper.

$3. PRINTING PRESS Prints cards, labels, etc. Circular press **$8.** Small newspaper size **$44.** Do your own printing and advertising. Make money printing for others. Fun for spare hours. Type-setting easy, printed rules. Send 2 stamps for catalogue of presses, type, cards, etc., to factory

KELSEY & CO., Meriden, Ct.

THE PERKINS' Wind Mill



is the Strongest and Best Self-Regulating Wind Mill made. Full instructions for erecting sent with the first mill. **All Wind Mills warranted.** For Circulars and Prices address

The Perkins' Wind Mill & Ax Co., Agents wanted. **Mishawaka, Ind.**

POTATO DIGGER

—THE— 'HOOVER'

A 16-page pamphlet **free** Mention this paper.

HOOVER & PROUT, Avery, Ohio.

FOR SALE—30 Good Missouri Farms near St. Louis, write for descriptions. **BETTS,** 525 Chestnut St., **Established, 1860.** **St. Louis, Mo.**

FRANK B. BARKLEY
MANUFACTURING CO.
CINCINNATI, O.

BARKLEY HARNESS $5.50
ROAD CARTS $11.50
BUGGIES $55.00 UPWARDS

FOR 20 consecutive YEARS

We have made and sold

HARNESS

TO DEALERS.

BUT NOW we are selling direct to the consumers, saving you the Traveling Man's expenses and Dealers' profits. Write for illustrated catalogue and prices.

FRANK B. BARKLEY MFG. CO.,
271 & 273 MAIN STREET, CINCINNATI, O.

FOR BEST HAY PRESSES
ALL STEEL PRESSES.

ADDRESS P. K. DEDERICK & CO.
DEDERICK'S WORKS, ALBANY, N.Y.

31

BUY WALL PAPERS BY MAIL.

SAVE HALF OR MORE AS WE SELL AT FACTORY PRICES AND SELECT FROM BEST FACTORIES ONLY.

Pretty Patterns with Match Borders, - - 3 to 5c. per roll.
Beautiful Gilt with Match Borders, - - 5 to 20c. per roll.
6 to 18-in. Gilt Borders to Match Papers, - 2 to 3c. per yd.
4 to 9-in. Borders, without Gilt, to Match Papers, 1c. per yd.
Send 6c. in Stamps, for 100 Samples. Name this Paper.
Agents Wanted. F. H. CADY, 305 High St., Providence, R. I.

$6000.00 a year is being made by John R. Goodwin, Troy, N.Y., at work for us. Reader, you may not make as much, but we can teach you quickly how to earn from $5 to $10 a day at the start, and more as you go on. Both sexes, all ages. In any part of America, you can commence at home, giving all your time, or spare moments only to the work. All is new. Great pay SURE for every worker. We start you, furnishing everything. EASILY, SPEEDILY learned. PARTICULARS FREE. Address at once, STINSON & CO., PORTLAND, MAINE.

STEEL ROOFING.

BEST AND CHEAPEST ON EARTH.

PRICES AND SAMPLES ON APPLICATION.

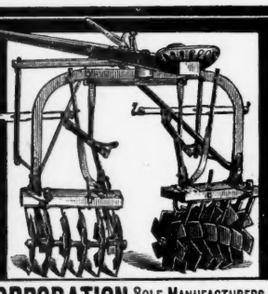
THE BERGER MFG. CO.,
200 to 210 East 9th St. Canton, O.

SUPERIOR STEEL ROOFING

Made of

Write for Catalogue, samples and price list. } Strictly Genuine Steel. Also SIDING, CEILINGS, etc.
KANNEBERG ROOFING CO., Canton Ohio.

THE CLARK'S CUTAWAY CORN CULTIVATOR



IT WILL CULTIVATE CORN and COTTON to a Height of THREE FEET
Throwing the Soil to or from the Plant.
Send for Special Circular.

HIGGANUM MANUFACTURING CORPORATION SOLE MANUFACTURERS HIGGANUM, CONN.
New York Office, 189 & 191 Water St. NEW YORK.

A 4 BOTTLE BABCOCK MILK TESTER

will tell the butter value of milk, or a good cow from a poor one, in ten minutes. *Warranted accurate and complete.* Price, $10.00.
Write CORNISH, CURTIS & GREENE, FORT ATKINSON, WIS.

PREPARED

Bordeaux - Mixture

Ammoniacal Solution of Copper.
Precip. Carbonate Copper,
Prepared Lime, Ammonia,
Agricultural and other Chemicals,
— FOR —

SPRAYING FRUIT TREES.

Small and Large quantities, in Economical and Convenient Forms. Send for pamphlet.

W. S. POWELL & CO.,
Chemical Fertilizer Manufacturers,
BALTIMORE, MD.

MAUD S.

Double-Acting

SPRAY PUMP

as used in a barrel for SPRAYING FRUIT TREES, VEGETABLE, CROPS, etc.

$12 for Pump with 5 feet of Hose and Nozzle.

Send for circular. Address

Lansing Iron and Engine Works,
LANSING, MICH.
P. O. Box 473.

SPRAY YOUR FRUIT TREES AND VINES.

Wormy Fruit and Leaf Blight of Apples, Pears, Cherries, Plum Curculia prevented by spraying with the **EXCELSIOR SPRAY PUMP.** GRAPE and POTATO ROT prevented by using **EXCELSIOR KNAPSACK SPRAYER;** also injurious insects which infest Currants Gooseberries, Raspberries and Strawberries. **PERFECT FRUIT ALWAYS SELLS AT GOOD PRICES.**
Catalogue showing all injurious insects to fruits mailed free. Large stock of Fruit Trees, Vines and Berry Plants at **Bottom Prices.**
Address, **WM. STAHL, Quincy, Illinois.**

The Improved RELIABLE PUMP.

All working parts now made of brass. There should be one in every house for use in case of Fire. No farmer or gardener should be without one for spraying trees, washing windows, washing buggies, etc. Fruit Growers can save their fruit, such as Cherries, Apples, Peaches, Plums, Currants, or fruit of any kind, where Insect will destroy it. Each Pump has two nozzles, one for solid stream and the other for spraying. This Pump is the best for the money in the market, is double acting, will throw a stream 50 to 60 feet horizontally, or 25 to 30 feet high, and is the cheapest pump on the market. Price only $3.50 each. **THE GEO. WORTHINGTON CO., 95 and 97 St. Clair St., Cleveland, Ohio.**

ESTABLISHED JAN. 1st, 1866.
PATENT WATER PROOFED

CHEAP STRONG **WATER PROOF;** Applied by our new Patent method with ⅓ the labor of any other way. Unlike any other roof. **No rust or rattle.** An **Economical** and **DURABLE SUBSTITUTE** for **PLASTER** on walls. **Ornamental CARPETS** and **RUGS** of same material, **cheaper** and **better** than Oil Cloths. Catalogue and **Samples Free.**
W. H. FAY & CO. CAMDEN, N.J.

GENUINE PHILADELPHIA.
300,000 IN THE FIELD.

HAND SIZES 10 TO 20 INCHES.
BOTH OPEN AND SOLID CYLINDERS.
PONY AND HORSE 30 AND 36 INCHES.
LAWN SWEEPERS AND GRASS EDGERS.

GRAHAM, EMLEN & PASSMORE,
631 Market Street, - Philadelphia, Penn.

$17 SPRAYING OUTFIT Express Prepaid for **$5.50**

Combines Three Complete Brass Machines.

A valuable illustrated book free.—"Our Insect Foes." GOODS GUARANTEED AS REPRESENTED OR MONEY REFUNDED. Get my illustrated catalogue before buying a *spraying outfit. Write at once and mention this paper.*
Address **P. C. LEWIS, Catskill, N. Y.**

Stallmist oder Kunstdunger?

Eine Abhandlung v. **Dr. Max Maercker,** Professor am landwirtsch. Institut in Halle a S., versendet die Verlagshandlung von **Paul Parey** in **Berlin SW.,** 10 Hedemannstr.

gratis und franko.

IDEAL JUNIOR.

Has fewer parts and joints, hence simplest. Is the

Lightest, Strongest, Cheapest,

of all Sectional Wheel Wind Mills. Is thoroughly well made of best materials. Runs without a tail and governs perfectly. We stand behind the Ideal Junior with a strong warranty. Prices and catalogue cheerfully furnished.

STOVER MFG. CO., 510 River Street, FREEPORT, ILL.

SPRAYING OUTFITS

Cheapest & Best. Our PERFECTION stirs the liquid automatically and will spray 100 trees per hour. We place on the market this season three new and improved machines, including a new Knapsack Sprayer for Vineyards and Nurseries. Also an improved Horsepower Apparatus at low price. Circulars FREE. FIELD FORCE PUMP CO. Lockport, N.Y.

NEW CARDS Send 2c. stamp for the LARGEST SAMPLE BOOK of genuine hidden name, silk fringe, envelope and calling cards ever offered. BUCKEYE CARD CO., Leesville, Ohio.

CORN FERTILIZER —$20 PER TON— Sold to Farmers direct from our Works. No Agents. YORK CHEMICAL WORKS, York, Pa.

THE ELKHART CARRIAGE AND HARNESS MFG. CO.

No. 1 Farm Harness. $24.50.

For 18 Years have dealt direct with consumers, at wholesale prices, *saving them the dealer's profit.* We ship anywhere, with privilege of examining before buying. We pay freight charges both ways if not satisfactory. Warrant everything for 2 years. Any one who can write can order a Buggy or Harness from us, as well as pay $10 to $50 to some middleman to order for them. We give no credit, and have

ONE PRICE ONLY

Platform, Three-Spring or Combination Wagons, $60; same as others sell at $85.
Top Buggies, $65; good as sold at $90.
Ours at $100 *fine as sell for* $135.
Phaetons, $110; same as sell at $150.
Fine Road Cart—with dash—$15.
Boxing free. We take all risk of damage in shipping.

No. 15 Cart, $21.

No. 31, $65

No. 41 Wagon $50.

OUR HARNESS

Are all No. 1 Oak Leather.
Single, $9 to $20. Light Double, $20 to $40.
64-page Illustrated Catalogue Free. Address W. B. PRATT, Sec'y, ELKHART, IND.

HAWKEYE GRUB and STUMP MACHINE

Works on either standing timber or stumps. Will pull an ordinary Grub in 1½ minutes. Makes a clean sweep of **Two Acres at a sitting.** A man, a boy and a horse can operate it. No heavy chains or rods to handle. The crop on a few acres the first year will pay for the Machine. **Send postal card for Illust'd Catalogue, giving price, terms and testimonials. JAMES MILNE & SON, Sole M'f'rs, Scotch Grove, Iowa.**

JAPANESE INSECT DESTROYER For the protection of Cabbage, Squash, Cucumbers, in fact all vegetation from destructive insects. Contains no poison. Price by mail 25c. Stamps accepted. **Friend Medicine Co., Gresham, Neb.**

TALKS ON MANURES.

FIFTH EDITION.

FEED THE SOIL AND IT WILL FEED YOU.

How to do it Profitably Fully Explained in a Series of Practical and Familiar Talks between the Author and the Deacon, the Doctor, and other Neighbors, on the whole subject of

MANURES AND FERTILIZERS.

By JOSEPH HARRIS, M. S.

Author of "Walks and Talks on the Farm." "Harris on the Pig," etc.

Including a chapter specially written for it by Sir John Bennet Lawes, of Rothamsted, Eng.

There is scarcely any point relating to fertilizing the soil, including the suitable manures for special crops, that is not treated, and while the teachings are founded upon the most elaborate scientific researches, they are so far divested of the technical language of science as to commend themselves to farmers as eminently "practical." It is not often that the results of scientific investigations are presented in a manner so thoroughly popular.

This work, containing 40 chapters and 366 pages with an appendix, treats on the following subjects:

Farming as a Business; What is Manure? Something about Plant-food; Natural Manure; Swamp-muck and Peat as Manure; What is Potential Ammonia? Tillage is Manure; Summer-fallowing; How to Restore a Worn-out Farm; How to Make Manure; The Value of Manure Depends upon the Food; Food which Makes Rich Manure; Horse Manure and Farmyard Manure; Fermenting Manure; Keeping Manure under Cover; An English Plan of Keeping Manure; Soluble Phosphates in Farmyard Manure; How the Deacon makes Manure: How John Johnston Manages his Manure; the Author's Plan of Managing Manure; Management Continued; Manure on Dairy Farms; Management of Manures on Grain Farms; The Cheapest Manure a Farmer can use: Dr. Voelcker's Experiments on Clover; Experiments on Clover Soils from Burcott Lodge Farm, Leighton Buzzard; Lawes and Gilbert's Experiments on Wheat; Lime as a Manure; Manures for Barley; Manures for Oats; Manures for Potatoes; What Crops shou'd Manure be Applied to? Manures on Permanent Meadows and Pastures; Manures for Special Crops; Manures for Garden and Orchards; Different Kinds of Manures; Bone Dust and Superphosphate of Lime; Special Manures; Value of Fertilizers; Restoring Fertility to the soil.

Cloth, 12mo. Price, postpaid, $1.75.

Sent postpaid to all parts of the World with the exception of South Africa for which must be added one shilling for each four shillings' worth of Books

ORANGE JUDD CO.,

PUBLISHERS AND IMPORTERS OF RURAL BOOKS,

52 & 54 Lafayette Place, New York.

JOSEPH GILLOTT'S STEEL PENS.

GOLD MEDAL, PARIS EXPOSITION, 1889.

THE MOST PERFECT OF PENS.

EVERYBODY Wants This. Adjustable Sitz Bath in one.

PORTABLE BATHS. Best ever known. Wholesale and Retail. Agents Wanted Everywhere. Send for Circulars. E. J. KNOWLTON, Ann Arbor, Mich.

UNIVERSITY OF PENNSYLVANIA VETERINARY DEPARTMENT.

Most complete course of Veterinary Instruction in America. For catalogue address JOHN MARSHALL, M.D., Dean of Veterinary Faculty, University of Pennsylvania, Philadelphia, Pa.

PATENTS THOMAS P. SIMPSON, Washington, D. C. No atty's fee until Patent obtained. Write for Inventor's Guide.

SHORTHAND Writing *thoroughly taught* by mail or personally. Situations procured all pupils when competent. Send for circular. W. G. CHAFFEE, Oswego, N.Y.

BEST PAYING THING for Agents is our PHOTOGRAPH FAMILY RECORD PICTURE. Agents wanted. Terms extra liberal. Addr's. *Dept. 2*—C. P. CORY & CO., 325 State-st., Chicago.

BICYCLES ON EASY PAYMENTS No extra charge. All makes new or 2d hand. Lowest prices guaranteed. Send for cats and save money. Rouse, Hazard & Co., 32 G St. Peoria, Ill

FIBROUS ROOFING CEMENT.

Stops any leak in any roof by any body in a few minutes, for a few cents. Circular free. A. T. JEWETT, Steubenville, Ohio.

TOKOLOGY Complete LADIES GUIDE. Alice B. Stockham, M. D. The very best book for AGENTS. Sample pages free. Prepaid $2.75. A. B. Stockham & Co., 167 La Salle St., Chicago.

WANTED ONE BOY & ONE GIRL in every city, town and village to learn to ride a new improved and very handsome Safety Bicycle. We furnish the Bicycle free, on very easy conditions, and it costs you no money. If you want a bicycle without buying it or paying one cent for it send your name and address at once to Western Pearl Co., 308 Dearborn St., Chicago, Ill.

JUVENILE TYPE-WRITER AND PRINTING OUTFIT, POSTPAID, ONLY 40c.

Will last for Years. Writes Letters and Correspondence. Prints Cards, Labels, Envelopes, Linen, &c. No loose letters to get lost. Useful invention. Club of 3 for $1.00, 7 for $2.00. Retails for 85c. IMPERIAL P. & P. with name 10c. Club 14 for $1.00 Post Paid. THALMAN MFG. CO., No. 257 Balt. St., Baltimore, Md., U.S.A.

WE have several very good men at present, whom we can recommend as farm managers. Men of experience and ability, well versed in agricultural matters generally and in the breeding and raising of stock in particular. Correspondence solicited. PETER HENDERSON & CO., 35 and 37 Cortlandt St., New York City.

CRANBERRY CULTURE.

Natural History, Cultivation, Management, etc.

By J. J. WHITE.

Millions of dollars are spent annually by the American people for cranberries. **Properly managed** there is **not a more profitable industry** than the cultivation of this fruit. "Cranberry Culture" is **a practical treatise** on the subject and **should be** in the hands of **every one** who expects to embark in cranberry growing. It tells **all about cultivation, choice of location, preparation of the ground, planting the vines, management of meadows, flooding, enemies and difficulties, picking, keeping, profit and loss, and every other detail** connected with the business. The work also gives full account of the different varieties in cultivation and it is regarded as the **most complete and satisfactory** of the **many special treatises** on Fruit Culture. The **directions** are admirably **full and clear,** and the author has anticipated every difficulty the novice is likely to encounter. Since the first edition appeared, many particulars relating to the Culture have been modified, and improvements and discoveries made. All these have been incorporated in the present edition, which is a complete exponent of our knowledge of Cranberry Culture.

Profusely Illustrated.

CLOTH, 12mo. PRICE, POSTPAID, $1 25.

Sent postpaid to all parts of the World with the exception of South Africa, for which must be added one shilling for each four shillings' worth of Books.

ORANGE JUDD CO.,

Publishers and Importers of Rural Books.

52 & 54 Lafayette Place, New York.

* NEW *

ILLUSTRATED CATALOGUE

OF THE

Orange Judd Company,

PUBLISHERS & IMPORTERS

—OF—

RURAL BOOKS

For Farmers, Stock Raisers, Gardeners, Housekeepers, Florists, Fruit Growers, Architects, Artisans, and Sportsmen.

PUBLISHERS OF THE

AMERICAN AGRICULTURIST,

52 & 54 Lafayette Place, New York.

WE PRESENT, IN THIS CATALOGUE, DESCRIPTIONS WITH MANY ILLUSTRATIONS OF

NEARLY 600 STANDARD WORKS

ON THE FOLLOWING SUBJECTS:

Farm and Garden,
Fruits, Flowers, etc.,
Cattle, Sheep and Swine,
Dogs, etc., Horses, Riding, etc.,
Poultry, Pigeons & Bees,
Angling and Fishing,
Boating, Canoeing and Sailing,
Field Sports and Natural History,
Hunting, Shooting, etc.,
Architecture and Building,
Landscape Gardening,
Household and Miscellaneous.

In this list will be found not only our own but other publications of value and interest.

We are prepared to supply the trade, or individual purchasers, with these books.

They will be forwarded by mail, postpaid, to all parts of the World for catalogue price with the exception of South Africa, for which must be added one shilling for each four shillings' worth of books.

IT WILL PAY ***Every man, young or old, to provide himself with good books, even if economy has to be practiced in other directions to enable him to do this.***

This Catalogue contains 112 pages and cover.

Sent free to all **regular customers** and **those purchasing one** or **more** of our **books.**

To all others for **six cents** in **stamps,** which can be **deducted** from amount of **first purchase** made.

ORANGE JUDD COMPANY,

52 & 54 LAFAYETTE PLACE, NEW YORK.

HARRIS'S INSECTS INJURIOUS TO VEGETATION.

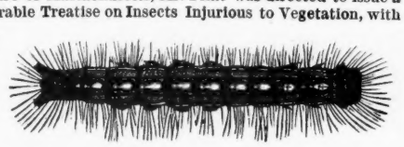
BY THE LATE THADDEUS WILLIAM HARRIS, M. D.

OCTAVO, 640 PAGES,

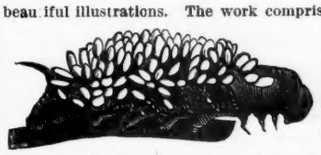
Enlarged and improved with additions from the author's manuscripts and original notes, Illustrated by engravings drawn from Nature under the supervision of Professor Agassiz, edited by Charles L. Flint, late Secretary of the Massachusetts State Board of Agriculture. The work is fully illustrated with two hundred and seventy-eight fine wood cuts, and eight beautiful steel plates, full page size, containing ninety-five figures.

APPENDIX.

By a resolve of the Legislature of Massachusetts, Mr. Flint was directed to issue a new edition of Dr. Harris's admirable Treatise on Insects Injurious to Vegetation, with suitable additions and illustrations, and was also authorized to use the plates prepared for the editions for the Commonwealth in the publication of one or more editions designed for wider circulation than that for the State could be expected to have. It was thought best to insert the additions contemplated in the resolve in the form of foot-notes. No alterations have been made in the author's language, and the additional notes are inclosed in brackets, to distinguish them from those in former editions. Large additions have been made in the text, however, from the author's own manuscript. These will be found exclusively in the chapters upon the butterflies. Professor Agassiz very kindly offered to supervise the drawings, comparing them with the original specimens before engraving. It is believed that very great scientific accuracy has thus been secured in the illustrations.



This work is the most popular one on entomology, and indeed, almost the only one not intended for the purely scientific student. The familiar descriptions of the insects are much aided by the beautiful illustrations. The work comprises those which are injurious to cultivated and wild plants, and is sufficiently systematic to give a general idea of the classification of insects. It takes a practical view of the matter, as well as a scientific one, and gives the means, as far as known, of combating these enemies of the cultivator. In concluding his preface to the second edition of this work, Dr. Harris wrote: "In the course of eight years, all the copies of the Report, and of the other impression, were entirely disposed of. Meanwhile some materials for a new edition were collected, and these have been embodied in the present work. Believing that the aid of science tends greatly to improve the condition of any people engaged in agriculture and horticulture, and that these pursuits form the basis of our prosperity, and are the safeguards of our liberty and independence, I have felt it to be my duty, in treating of the subject assigned to me, to make it useful, and acceptable, to those persons whose honorable employment is the cultivation of the soil."



Price Postpaid, Plain Edition, - $4.00.
Price Postpaid, Colored Plates, - 6.50.

Sent postpaid to all parts of the World with the exception of South Africa for which must be added one shilling for each four shillings' worth of Books.

ORANGE JUDD CO., 52 and 54 Lafayette Place, New York.

$25.00 WORTH OF NEW MUSIC FOR $1.75,

--AND--

THE AMERICAN AGRICULTURIST ONE YEAR FREE.

A RARE CHANCE FOR MUSICIANS AND MUSIC LOVERS.

EVERYBODY likes good music which is seldom offered at anything like reasonable prices. REALIZING THIS we have entered into an arra ngement which must meet the approbation of those of our subscribers who are musically inclined. THIS MUSIC will not be old, time-worn, and out-of-date compositions; it will be NEW, FRESH AND POPULAR.

Latest and most popular music, Vocal or Instrumental, which sells from 40c to 75c each for less than 1c each, by accepting our combination offer to furnish YOUR CHOICE of the VOCAL OR INSTRUMENTAL sheets of music by subscription INCLUDING THE AMERICAN AGRICULTURIST ONE YEAR for $1.75, or both Vocal and Instrumental Libraries and American Agriculturist one year for $2.25.

THE PIANIST AND VOCALIST BONANZA.

You may obtain, as soon as published, the latest music of the day; nothing old will appear in these libraries. They are printed from the finest plates on the best paper regular full sheet size. Each number contains 16 pages, from three to six pieces each which would ordinarily retail from 40c to 75c each piece. Your subscription can begin with any number. The following are the contents of late numbers:

CONTENTS OF Part 3, Vol. 1. VOCAL LIBRARY.

ENNISCORTHY,	Francis.
BLUE BIRDS ON THE WILLOW,	Raymond.
DON'T KNOW (from Faust up to date),	
STELLA SONG (from Clover).	
THOUGH BY A STRANGE CAPRICE OF FATE,	Oolah

CONTENTS OF Part 4, Vol. 1. VOCAL LIBRARY.

YOU CAN GUESS WE'LL NEVER TELL,	Dobson.
WHY NOT TO-DAY.	Cooke.
I CANNA WED AN OLD MAN,	Willard.
I WHISTLE AND WAIT FOR KATIE.	Nolan.

CONTENTS OF Part 5, Vol. 1. VOCAL LIBRARY.

ONLY DREAMS (from the Red Hussar),	Solomon.
TOO LATE.	Straletzky.
WHITE SAILS IN THE HARBOR,	Skelly.
LA PALOMA (The Dove),	Yradier.

CONTENTS OF Part 3, Vol, 1. INSTRUMENTAL LIBRARY.

GONDOLIER'S LANCIERS,	Francis.
OUR OWN NEW SOCIETY DANCE,	Francis.
DAZZLING EYES, Polka,	Bayliss.
LITTLE PLAYER,	Bulling.

CONTENTS OF Prt 4, Vol. 1. INSTRUMENTAL LIBRARY.

YOU & YOU, (Du und du) Waltz,	Strauss.
LITTLE SINGER,	Pulling.
HEEL & TOE, Polka,	Putnam.
COLLEGE SONGS LANCIERS,	Himan.
A NEW YORKE DANCE,	Hoffman.

CONTENTS OF Part 5, Vol. 1. INSTRUMENTAL LIBRARY.

DUDE'S MARCH,	Wagner.
POLISH DANCE,	Brandies.
FAUST UP TO DATE LANCIERS,	Francis.
CHIC POLKA,	Strauss.

FURTHERMORE,

All subscribers to the above combination offers will be entitled to a certificate on which they can obtain during the year any piece of Instrumental or Vocal music at 50 per cent less than catalogue prices.

In sending your subscription be SURE and state if you wish the VOCAL or INSTRUMENTAL Libraries. They are published separately as designated above. Address

---

PERFECTION HAMMOCK PRESENTED for ONLY 3 SUBSCRIBERS.

THIS HAMMOCK AND THE AMERICAN AGRICULTURST ONE YEAR ONLY $2.00 POST-PAID.

The Best, Strongest and Most Beautiful Hammock in the World.

The peculiar value of these Hammocks lies in the fact that **the body is woven,** not knit, as in the ordinary Hammock, and **does not pull buttons from the clothing. It conforms itself to every motion of the body,** has the **elasticity of the best spring bed,** and is made **strong** and **beautiful. It overcomes all the objections** to the netted and Mexican Hammock, and is indeed **a decided luxury.** These Hammocks have the patent iron ends, presenting a straight side to the body of the Hammock so that the **ends** are **flat** and **smooth** instead of being rolled up, as is the case with a round ring, or the Mexican Hammock. They are admitted by all to be the **strongest** and **most durable Hammock in the World** as well as the most beautiful. For young children they are much **more comfortable** and **cool than cradles or beds.**

We will send a **No. 4 Hammock,** the size usually desired, for **$1.20 by mail, post-paid,** or with the AMERICAN AGRICULTURIST one year for only $2.00, post-paid. The No. 4 is **11 feet in length and 3 feet wide,** and will easily sustain a weight of 300 to 400 lbs, and is the same Hammock that many storekeepers sell for $1.50 and $2.00.

Given for a club of three yearly subscriptions.

LARGER SIZES AS FOLLOWS:

No. 2. 12 feet long and 4 feet wide, by mail post-paid, $2, or with a year's subscription to the AMERICAN AGRICULTURIST, $2.75. Given for a club of five yearly subscriptions.

No. 1. 13 feet long and 4½ feet wide, by mail, post-paid, $2.25, or with a year's subscription to the AMERICAN AGRICULTURIST for only $3.00. Given for a club of six yearly subscriptions.

Any one receiving one of these Hammocks and not finding it just as advertised can have the purchase price refunded. We guarantee satisfaction to every customer.

WHAT OUR CUSTOMERS SAY.

"The Hammock bought of you last summer has **given good satisfaction.** I thought it very good for the price."—Henry S. Butler, Blairstown, N. J.

"I am **entirely satisfied** with the Hammock you sent me. It met my expectations fully."—[William Watkins, West Grafton, W. Va.

"The Hammock you sent me is **perfectly satisfactory in every way.** It fully meets my expectations and I find it **just as you advertised it to be.** It was **used all summer,** and is now apparently as **good as ever."**—[Mary R. Flint, Winchester, N. H.

"The hammock was all I expected. **Very good, substantial** and **worth all it cost.** I consider it **a bargain."**—[O. P. Jones, Phillipsburg, Pa.

"The Hammock we received from you was in **constant use last season,** and was **satisfactory in every respect."**—[A. Howe, Hampton, Va.

Address all orders to AMERICAN AGRICULTURIST, 52 and 54 Lafayette Pace, New York.

Home Floriculture.

By EBEN E. REXFORD.

A VALUABLE WORK

—ON THE—

Cultivation of Garden and House Plants.

12mo, Cloth, $1.50 postpaid.

All who are acquainted with Mr. Rexford's pleasant style of writing will know that this book must be attractive, and as it is written from his own experience it will have a

THOROUGHLY PRACTICAL VALUE.

This admirable work is written expressly for amateurs. The author is an amateur himself of vast experience, and not a professional florist, hence he knows exactly what advice the beginner needs. He has presented the subject of home floriculture in all its phases. Every one of the sixty-three chapters is full of profitable instruction, written in the author's clear and simple style. The rules given in the chapters on Watering and Wintering Plants are of inestimable value, and if followed would save many a person much perplexity and disappointment, who after carefully watering and tending his plants sees them gradually dying in spite of all. The chapter on Propagating and Training receives full attention, and in fact everything that is necessary to know in order to successfully cultivate plants in the home, in the garden, or in the greenhouse is fully explained. Then come chapters descriptive of the various kinds of pot and other plants and bulbs that may be grown to the best advantage; also an entertaining chapter on floral decorations for the room and table, which will be found helpful to all interested in the subject.

Chapters on Soil for Pot Plants; Potting; Watering Plants; Care of Plants in Window; Propagation of Plants; Training Plants; Insects, and How to Fight Them; Care of House Plants During Summer and Fall; Fertilizers; Diseased Plants; Winter Precautions; Resting Plants; Plants Best Adapted to Window Culture; The Window Box; Bulbs for Winter Flowering; Miscellaneous Hints; Ferneries; Vines for House Culture; Basket Plants; Plants and Flowers in Room and Table Decorations; Small Greenhouse; Heating and Interior Arrangement of Greenhouse; Plants for Greenhouse Culture; Preparing Beds of Annuals: Sowing Seeds in Beds and Starting Plants in House; The Best Annuals; Plants for Edging; Border Plants; Tuberose and Gladioli; Bedding Plants; Bulbs; Lilies; Vines; Shrubs; Flowers for Cemetery Use; Cutting and Arranging Flowers; Making a Lawn; Fall Work in Garden; Postscript of Odds and Ends, &c., &c.

Written in such a Plain and Comprehensive Manner that a child can understand it. No excuse for failures now.

ELEGANTLY ILLUSTRATED AND HANDSOMELY BOUND.

BEAUTIFYING COUNTRY HOMES.

A Handbook of Landscape Gardening. By J. Weidenmann.

A SPLENDID QUARTO VOLUME. BEAUTIFULLY ILLUSTRATED WITH NUMEROUS FINE WOOD ENGRAVINGS, AND WITH 17 FULL-PAGE AND 7 DOUBLE-PAGE COLORED LITHOGRAPHS OF PLACES ALREADY IMPROVED.

For years the popular taste for Landscape Gardening and Architecture has wonderfully advanced. In this work every builder on, or owner of, an eligible site, large or small can find many valuable suggestions, as well as a great variety of exquisite plans to choose from.

The work is prepared with careful judgment and those who desire to make the most of it in the way of convenience and to increase their knowledge of landscape gardening are in need of this practical work. It furnishes minute instructions for the laying out of grounds and the planting of trees, their selection, the grouping of flowers, water ornamentation, rock work, and general improvement.

The chapter on "Improving New Places Economically" would be worth more than the cost of the book ten times to many persons. The whole is illustrated, not only by little sketches, but by a series of **full-page lithographs** of **places** which have been **actually treated** in accordance with the principles laid down, with **list** of **trees** and **shrubs** and other useful suggestions.

CONTENTS.

General Suggestions; Lawns; Seeding Down Lawns and Pastures; Top Dressing Lawns; Drainage; Roads and Drives; Walks; Laying Out Curved Lines for Walks or Roads; Practical Hints on Grading; Fences, Walls, and Hedges; Trees and Shrubs; Grouping; Transplanting Trees and Shrubs; Flower Garden; Water; Ornamentation; Rock Work; Tools Used in Laying Out Grounds; Improving New Places Economically; Arbitrary Calculation of Cost; Care and Keeping of Ornamental Grounds; Front Yards of City Lots; Hints on Burial Lots; and Plans of Improving Places.

Cloth, 4to, price $10.00.

Sent postpaid to all parts of the World with the exception of South Africa for which must be added one shilling for each four shillings' worth of Books.

ORANGE JUDD CO., 52 & 54 LAFAYETTE PLACE, NEW YORK.

Contents of This Number.

Apples for Milch Cows.....299
Animal Ailments.....308
Barley, Cultivation of—IV (Joseph Harris).....267
Basket Items.....298
Beans, Cultivation and Care of (Prof. W. W. Tracy).....274
Beans, Freeing from Weevils.....298
Bees and Bee Plants.....270
Beet Pulp, Dried.....278
Black Knot of Plum and Cherry Trees, The (Dr. B. D. Halsted).....3 *Illustrations*..281
BOYS AND GIRLS:
Rhoda's Memorial Day Apple Blossoms (Agnes Carr Sage).....*Illustrated*..290
Relics of Prehistoric and Indian Races (Charles H. Coe).....8 *Illustrations*..292
Marbles (Henry D. Taylor).....*Illustrated*..293
Prize Puzzle Contest.....293
Life in a Leaf (Stella Louise Hook).....2 *Illustrations*..293
Breeds, Selecting (Miss E. K. Winans).....289
Bright Prospects Ahead.....312
Bulbs, Spring Flowering.....6 *Illustrations*..282
Bulletins, Gleanings from the.....297
Cattle, Guernsey.....2 *Illustrations*..275
Cattle, Shorthorn.....299
Chinese Truck Farms in Montana (Rev. F. D. Kelsey) 4 *Illustrations*..279
Corn Crop, A Big, Wanted.....274
Corn, Grains of.....280
Creamery, Model, A (W. E. Partridge).....*Illustrated*..273
Depth to Plant.....276
Farmer Professor, A.....*Illustrated*..297
Farm Accounts, Keeping.....272
Farming in Foreign Lands.....296
Foul Brood—Its Cause, Prevention and Cure (Allen Pringle).....276
Fowl, Naked-Necked, The.....*Illustrated*..269
FROM NEAR AND FAR:
Grape Growing in the South.....294
Women Farmers in Germany.....294
The Colorado Rainbelt.....294
California's Greatest Industry.....294
The Oregon Fruit Market.....294
The Agriculture of Jamaica.....295
A French Characteristic.....*Illustrated*..295
A Rich Dairy Region.....295
Wyoming Coming to the Front.....295
Fruits in Dakota.....295
Gardens, Farmers' (C. L. Allen).....283
Geese are Healthy Fowls.....269
Grass, When to Cut for Hay (J. M. Trowbridge).....277
Grapes, Mildew in.....298
Greece, Modern, Agriculture, The (Frank G. Carpenter) .....*Frontispiece*..266
Hay or Grass, How Much a Horse or Cow Will Eat.....298
Helpful Hints.....307
Horse, File Maker, The Famous Jumping..*Illustrated*..277
Horseshoes, Paper.....277
HOUSEHOLD:
Bob Bill and His Waker (George A. Stockman) 2 .....*Illustrations*..286
How to Make a Hammock (Eva M. Niles) 6.....*Illustrations*..287
A Pretty and Serviceable Splasher (Francis H. Perry) .....*Illustrated*..287
Potato Cozy (F. P. Scribbler).....*Illustrated*..287
A Boot Button Case (Annie Hamilton)...*Illustrated*..288
A Chimney Corner (Webb Donnell)....2 *Illustrations*..288
A Balloon Match-Receiver (Susie C. Standish).....*Illustrated*..288
A Home-Made Carpet Stretcher (Alice E. Pinney) .....*Illustrated*..288
A Pretty Wedding Gift (Lydia Holly).....288
Beds and Bedding (M. W. Early).....289
Cotton Gowns and Straw Hats.....289
Strawberries for Present and Future Use.....289
ISSUES OF THE DAY:
The Farmer in the Impending Change (C. Wood Davis).....300
Some Causes of Hard Times (J. J. New).....3 1
The New Movement for Better Roads (Andrew D. White).....301
The Department of Agriculture.....302
Of International Interest.....302
Lambs, Disowned, Care of (H. Cassady).....270
Lime as a Disinfectant.....274
Matters of Business.....312
Milk Veins.....298
Nest-Eggs, How to Make.....3 *Illustrations*..271
Our Library Corner.....306
Peas, How to Bush.....284
Pigs, Spring (A. H. Sheldon).....271
Pineapple Culture in Florida (James K. Reeve).....*Illustrated*..284
Roads, Aids to Better (Hollister Sage)..3 *Illustrations*..272
Salmon Trout Culture on the Farm...(Webb Donnell)..278
Science in Farming.....297
Seeds, Poor.....284
Soot and Lampblack for Manure.....299
Stock, Young, in Spring.....271
Sugar-Beet Culture in America (Prof. W. M. Hays).....268
Swine, Chester White.....*Illustrated*..271
Tobacco—Planting and Cultivation (W. F. Andross)....280
Trees, Lawn and Shade, Experience with (A. S. Fuller) 276
Tomatoes, Large.....298
Tripe.....298

FEARLESS.

This Threshing-machine received the two last **Gold Medals** given by the New York State Agricultural Society; and has been selected, over all others, and illustrated and described in that great work, "Appleton's Cyclopedia of Applied Mechanics;" thus, establishing it as the **standard** machine of America. **Straw-preserving Rye-Threshers, Clover-hullers, Ensilage-cutters, Feed-mills, Fanning-mills, and Wood Saw-machines;** all of the **best** in market. The **Fearless Horse-powers** are the most **economical and best** Powers built for the running of Ensilage cutters, Cotton-gins, and general farm and plantation use. For free Catalogues, address

MINARD HARDER, Cobleskill, N. Y.

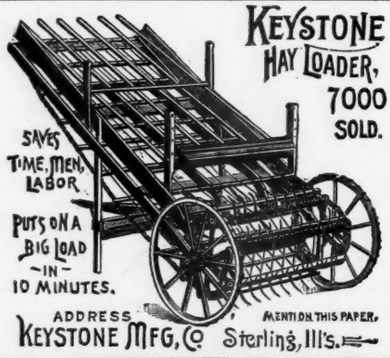
EUREKA Send 5 Cents in Stamps for **100 PAGE CATALOGUE**

OF INCUBATORS AND BROODERS.

J. L. CAMPBELL,
West Elizabeth, Pa.

Cut this ad. out and pin it on your order. I will accept it as cash for one dollar in part payment for an incubator. (No. 20 R)

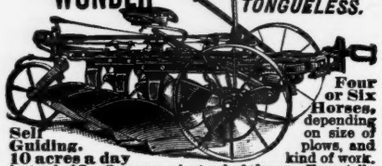
KEYSTONE HAY LOADER, 7000 SOLD.



SAVES TIME, MEN, LABOR.
PUTS ON A BIG LOAD —IN— 10 MINUTES.

ADDRESS KEYSTONE MFG. Co Sterling, Ill's. MENTION THIS PAPER.

SOLID COMFORT "WONDER" ON WHEELS" TONGUELESS.



Self Guiding. **Four or Six Horses,** depending on size of plows, and kind of work. **10 acres a day** instead of **3. One man** instead of **three.** Especially adapted to traction engine. Uses wheel landside which resists pressure of three furrows. No bottom or side friction. Weight of furrows, frame and plowman carried on three greased spindles. Draft reduced to lowest possible limit. Foot brake prevents Gang running on team. Lever and turning device within easy reach. **Easier Driving, Straighter Furrows, and LIGHTER DRAFT** than any Gang in America. **Adjustable frame**—can be narrowed or widened at will. Made with stubble, sod and stubble, or breaker bottoms. 10 or 12 inch cut.

ECONOMIST PLOW CO. SOUTH BEND, INDIANA.

☞ **Special prices and time for trial given** on first orders from points where we have no agents. Our book, **"FUN ON THE FARM,"** sent **Free** to all who mention this paper.

GOLD MEDAL, PARIS, 1878.

W. BAKER & CO.'S

Breakfast Cocoa

from which the excess of oil has been removed,

Is absolutely pure and it is soluble.

No Chemicals

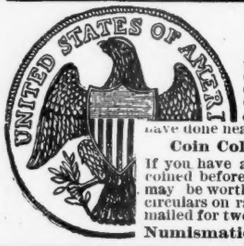
are used in its preparation. It has *more than three times the strength* of Cocoa mixed with Starch, Arrowroot or Sugar, and is therefore far more economical, *costing less than one cent a cup.* It is delicious, nourishing, strengthening, EASILY DIGESTED, and admirably adapted for invalids as well as for persons in health.

Sold by Grocers everywhere.

W. BAKER & CO., Dorchester, Mass.

MONEY can be earned at our NEW line of work, rapidly and honorably, by those of either sex, young or old, and in their own localities, wherever they live. Any one can do the work. Easy to learn. We furnish everything. We start you. No risk. You can devote your spare moments, or all your time to the work. This is an entirely new lead, and brings wonderful success to every worker. Beginners are earning from $25 to $50 per week and upwards, and more after a little experience. We can furnish you the employment and teach you FREE. No space to explain here. Full information FREE. **TRUE & CO.,** AUGUSTA, MAINE.

FOR YOU



MR. PARMELEE sold in three days, 116 Copper Coins for $6.915; 29 Silver Coins for $4,713; 4 Gold Coins for $1760. And we can prove that others have done nearly as well

Coin Collecting Pays Big.

If you have any Old Coins or Proofs coined before 1878, save them, as they may be worth a fortune. Illustrated circulars on rare coins free at office or mailed for two stamps.

Numismatic Bank, Boston, Mass.

Correspondence Solicited in any Part of the United States.

We issue a **100-page catalogue** of Musical Instruments, Accordeons, Banjos, Cornets, Fifes, Flutes, Guitars, Harmonicas, Instruction Books, Jews Harps, Music, Music Boxes, Strings, Violins, etc. Send address to **C. W. STORY, 28 Central-st. Boston, Mass.**

New style self-threading needles. Weak-sighted or blind can thread them. Finest silver eyeing steel. Sample papers by mail, 10c., 5 for 25c., 12 for 50c. Money easily made selling them. CHAS. E. MARSHALL, Lockport, N. Y.

AMERICAN AGRICULTURIST.

—o—

Terms of Subscription in the United States and British Provinces.

The Agriculturist is published monthly and is mailed in time to reach subscribers on or before the first of each month.

Terms.—Single subscriptions $1.50 per year or 75 cents for six months, payable in advance. Clubs of five or more, $1.00 per year, or 50 cents for six months.

A FREE copy for every club of five for either term.

Remittances.—Money for subscriptions can be sent by postal note, express or post-office money order, registered letter, check or draft; postage stamps accepted for fractional parts of a dollar.

Expiration of Subscription.—The date to which subscription is paid is indicated by the number on the printed label bearing the subscriber's name which is attached to the wrapper inclosing the magazine. If the number on your label is **531** it indicates that your subscription is paid up to and expires with the April number, **532** with this May number, and so on. The numbers of each issue will be found on the frontispiece.

Renewals.—Four weeks are required after the receipt of a renewal of subscription before number or date opposite name on address label can be changed. If at the expiration of this time any error is noticed subscribers will confer a favor by sending us notice. The number indicating the time to which subscription is paid is the subscriber's receipt for remittance. No other receipt is sent unless requested.

Discontinuances.—Responsible subscribers will continue to receive this magazine until the publishers are notified by letter to discontinue, when all arrearages must be paid. If you do not wish the magazine continued for another year after your subscription has expired, you should then notify us to discontinue it.

Change of Address.—When a change of address is desired both the old and the new address should be given.

New Subscriptions can commence at any time during the year and with any number desired.

Canvassers wanted in every town to solicit subscriptions. Terms sent on application.

Rates to Foreign Countries.

The yearly subscription of the AMERICAN AGRICULTURIST in shillings and pence to subscribers in foreign countries is as follows:

	s.	d.	U. S. cur.
Africa except Egypt, Liberia and Congo	10	3	$2.46
China	11	3	2.70
Madagascar	12	3	2.94
St. Helena	10	3	2.46
Transvaal	11	3	2.70
New South Wales	7	3	1.74
Victoria	7	3	1.74
Queensland	7	3	1.74
New Zealand	7	3	1.74
Tasmania	7	3	1.74

Countries in the Universal Postal Union, including Newfoundland, Egypt, Liberia, Congo, and all others not mentioned above, 7s 9d; United States currency, $1.86.

In clubs of five or more a discount of 50 cents, or two shillings one penny, is allowed on each subscription.

Remit by post-office money order, payable to AMERICAN AGRICULTURIST, at New York General Post-Office, and inclose the money order with your letter to avoid delay and possible loss. Drafts on New York are acceptable in the absence of any other form of remittance.

Advertising Rates.

Ordinary Pages, **$1.00** per line (agate), each insertion.
Last Page, and Third Cover Page, **$1.25** per line.
Second Cover Page, **$1.50** per line.
Page next to Reading and Last Cover Page, **$2.00** per line.
No advertisement taken for less than **$3.00** each insertion. Fourteen agate lines make one inch.

—o—

Direct all Business Communications pertaining to Subscriptions and Advertising to

AMERICAN AGRICULTURIST,
52 and 54 Lafayette Place, New York.